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The Bancroft Oration.¹

STAGES IN THE DEVELOPMENT OF THE OPERATIVE SURGERY OF PROSTATIC OBSTRUCTION.

By H. SIMPSON NEWLAND,
Adelaide.

THE name of Joseph Bancroft will always hold a place of honour in the history of Australian medicine by virtue of the fact that he is one of the few Australian scientists who have gained a world-wide reputation. He it was who discovered the parent worm of *Filaria sanguinis hominis*, and thereby came to be regarded as an authority on filarial disease. Although Bancroft died on June 16, 1894, thirty-two years elapsed before his great achievement, his scientific eminence in other directions and the fine qualities of his heart and mind led his professional fellow-men to found the Bancroft Oration as an enduring memorial. I am very sensible of the great honour of being a Bancroft Orator and of having my name recorded in the annals of the oration.

Bancroft was unquestionably a man of wide scientific interests and remarkable attainments. He had an experimental farm where he grew nearly a hundred different varieties of wheat, and discovered a rust-resisting variety suitable for Queensland. He also grew Japanese rice. Cultures far removed like that of the vine and of the oyster excited his interest. He was an authority on diseases of the banana and sugar-cane. His experiments in the hybridization of fruits produced several kinds of grapes and a particularly fine strawberry.

¹Delivered at a meeting of the Queensland Branch of the British Medical Association on June 3, 1949. This lecture was illustrated by lantern slides.

It is noteworthy that in the course of his professional career in Brisbane Bancroft held all the presidential offices, medical and scientific, which were open to him—an indication of the stature of the man.

This brief sketch of Bancroft's activities portrays my search for a subject for this oration. I was not prepared to orate on the succulent bivalve, on the strawberry or on the grape, nor did the banana, sugar-cane or Australian pemmican (a Bancroft dried-beef product) tempt me. Finally an inspiration came while I was reading a short biographical notice of Bancroft by his friend, the late Dr. E. Sandford Jackson. This notice included an unusual tribute: "He was among the best in the use of the catheter." The catheter Jackson had in mind was, of course, the silver metal catheter: a great comforter in the hands of him who can pass it gently into the bladder in retention of urine, a menacing and lethal instrument in rough hands. In Bancroft's time the passage of a catheter was, until the last ten years of his life, the only means available in the treatment of prostatic obstruction of the urethra. The catheter reigned solitary and supreme. Jackson's comment "he was among the best in the use of the catheter" led me to select "Stages in the Development of the Operative Surgery of Prostatic Obstruction" as the title of this address. The catheter still has a role to play in every operative procedure which has been designed for the relief or cure of prostatic obstruction. I hasten to say that this oration is in no sense a detailed account of the technique employed in the successive procedures in the evolution of prostatectomy. These details can be far more profitably studied in monographs and text-books. My purpose is to give a brief historical sketch of circumstances which preceded, prompted or influenced the radical methods of prostatectomy during the last seventy years.

The evolution of the operation of lithotomy is a stage in the evolution of prostatectomy.

It is difficult to understand why Hippocrates (460 to 370 B.C.) forbade his followers to operate for stone in the

bladder. "Neither will I cut them that have stone, but will leave this operation to those who are accustomed to perform it" is the phrase in the famous Hippocratic oath. He considered wounds of the bladder to be mortal and thought incisions into it did not heal. "It is possible", states Swift Joly, "that in his time the operation of lithotomy was habitually performed by itinerant specialists"; but the Hippocratic ban must have retarded the progress of vesical surgery. However, it does Hippocrates much credit that he knew his own limitations and stated them.

In Ancient Rome the first outstanding name was that of Celsus, who lived in the first century A.D. He sprang from a noble and wealthy family. His independent means tended to make him a little autocratic in his practice, as he refused to operate for stone except in the springtime and on boys between the ages of nine and fourteen years. In his great work "*De Medicina*" he gives so clear and detailed a description of the operation of lithotomy that he obviously must have performed it many times. He writes:

The physician, whose nails should be carefully cut, having moistened the index and middle fingers of the left hand with oil, introduces them gently into the anus one after the other. He presses with his right hand on the lower part of the abdomen, but gently, in order to avoid wounding the bladder by pressing too strongly on the stone. One must not hurry, but proceed with caution, for if the bladder is damaged the distension of the nerves will endanger the life of the patient. . . . The stone is sought for near the orifice of the bladder, and if it is found it will be easy to extract it. Having located and fixed the stone with the fingers in the rectum, a crescentic incision is made near the anus. A transverse incision in the deepest part of the wound opens the vesical orifice and allows the urine to escape. The opening should be larger than the stone.

A fistula is more apt to follow, he warns, if the neck of the bladder is torn during extraction of the stone.

As soon as this incision is made the stone is felt. If it is small, it can be pushed out into the wound by the fingers in the rectum, but if it is large it is necessary to pass a hook round it, and pull it out.

He counsels gentleness to avoid damaging the edges of the wound. This operation was known as "cutting on the gripe". Celsus describes an alternative method in which the stone was exposed by a single cut of the knife, but he liked it less. He also described catheterization—a description which Swift Joly states "is at least as good as that in many modern text books." Celsus pointed out that the catheter was necessary when the "canal is affected by atrophy in old age", a phrase expressive of prostatic obstruction. He recommended the use of a metal catheter. Such catheters have been found at Pompeii. They were made of bronze, with a widely open double curve rather like the old long S. The finish of the tip and the shape of the lateral eye are said to be better than in many modern instruments. Swift Joly comments that "it is extraordinary that the writings of Celsus had so little influence on his contemporaries or on his immediate successors. His writings were completely forgotten and not resuscitated until the 15th century". The median perineal lithotomy operation, founded on the erroneous idea that membranous parts would not heal after incision, while dilatation of them was comparatively harmless, was the operation in vogue for nearly 200 years.

A young Frenchman, Pierre Franco, a contemporary of Ambroise Paré, improved the operation of median perineal lithotomy by inventing instruments for it better than any devised before. The suprapubic or "high" operation was first performed in Europe by him in 1561 in very unusual circumstances. Franco gives a graphic description of the operation. His management of it proved him to be a man of resource. He tried to remove a calculus the size of a hen's egg from the bladder of a boy, aged two years. Using the median perineal incision and "finding it impossible to extract the stone through the narrow pelvis he pushed the stone back into the bladder and pressed it up against the abdominal wall. He then incised the skin above the pubis and cut down directly on to the stone.

This was extruded into the wound by pressure from the rectum aided by counter pressure on the abdominal wall above the level of the incision. The patient recovered after an illness lasting three months". For a child aged two years to survive he must have been "some boy". Franco performed the operation but once. He never realized the importance of the advance he had made. He advised others against following his example, since he thought the operation too dangerous. Franco has been blamed for not repeating the operation, but unjustly so, as in those days the risk of wounding the peritoneum was too great.

Most expert of all lithotomists were certain "wandering" Italians, whose methods a French surgeon, Germain Colet, studied in the sixteenth century. He performed the operation on the dead body, and observed the structures which the incision severed. There were eight generations of Colets who were lithotomists. A Colet, who was in favour with Louis XI (1461), urged that the operation should not be allowed to remain in the hands of ignorant wandering stone cutters. Learning of a malefactor who was sentenced to death and who had long suffered from stone in the bladder, he approached the king. With the royal consent this man's sentence was commuted from death to lithotomy. The king and interested members of his court assembled in the churchyard of Saint Severius to watch Colet operate. The operation proved successful; the patient secured his freedom, and Colet received a liberal pension and considerable kudos. The famous Ambroise Paré, when an apprentice to a barber surgeon, on one occasion held the kicking legs of a lithotomy patient.

It is only at the beginning of the sixteenth century that any mention is made of the "*grand appareil*"—that is, lithotomy with a grooved staff. The instrument was passed into the bladder in order to direct the course of the knife. Marianus Sanctus described the operation and the instruments necessary for it, but he gave all the credit for the discovery to his teacher, Jean de Romain. He recognized the difficulty of exposing the neck of the bladder, especially in children, and introduced a sound to lead him to it. The prostate was first described by Massa in the sixteenth century. Until then it had apparently been "cabin'd, cribb'd, confin'd". But it was not until the seventeenth century that Riolan discovered that obstruction to urination could be produced by enlargement of the prostate. His observation was very little noticed. A little later Morgagni gave an excellent description of the pathology and complications of certain cases of prostatic enlargement.

Jacques de Beaulieu (1651 to 1719), known as "*Frère Jacques*", was the greatest of the unqualified journeymen lithotomists. Jacques was first a labourer, then a soldier and finally a monk. He joined the Franciscans (though there is some doubt of this) and became *Frère Jacques*. He became famous for his skill in both suprapubic and perineal lithotomy. He favoured the latter method, improved its technique and published a description of it in 1702. Previously the perineal incision had always been made in the mid-line. Long experience and a study of the anatomy of the parts made it clear to *Frère Jacques* that the mid-line incision divided or endangered important structures, more especially the rectum. To avoid this an oblique perineal incision about an inch in a lateral direction and backwards usually on the left side avoided injury to that viscus. The advantage of the lateral operation, by which a free opening sufficiently large for the extraction of all but very large stones could be made into the bladder without laceration of the parts or injury to the rectum, was immediately recognized by the leading surgeons of the time, and the Marian procedure was universally abandoned. The surgeons of the *Hôtel Dieu* in Paris were ordered by the president of the French parliament to give the new lithotomist a trial. They agreed with rather a bad grace; but instead of providing a patient they inserted a stone into the bladder of a cadaver, and ordered *Frère Jacques* to remove it, which he quickly did. Méry, a French surgeon, afterwards dissected the parts. He found that the incision passed between

the *erector penis* and *accelerator urinae* muscles without wounding either. The deeper portion of the wound divided the whole thickness of the prostate in a postero-lateral direction and involved the neck of the bladder. He pointed out that the incision endangered no important blood vessels, and that contusion or tearing of the vesical orifice was avoided.

In the median and lateral operations of lithotomy when hypertrophy of the prostate was present, the finger of the operator would often not be long enough to reach the interior of the bladder. Consequently a pedunculated mid-lobe of the prostate, although it could not be felt, was exposed to the chance of being grasped in the blades of the lithotomy forceps and removed. There can be little doubt that in some cases the chance became a reality.

In the middle of the seventeenth century a few surgeons in England were venturing to cut for stone, the median incision being employed. When Samuel Pepys was "cut" that procedure was adopted. The story goes that Pepys had his stone mounted in an elegant box, which would show it off to the best advantage. Every year on May 1, he gave a party, and asked all those who had suffered the same experience to celebrate the occasion.

Cheselden (1688 to 1752), the leading English surgeon in the first half of the eighteenth century, was appointed surgeon to Saint Thomas's Hospital (1718). In 1723 he published a "Treatise on the High Operation for Stone", but in this he was forestalled by John Douglas, a surgeon to Westminster Hospital. Douglas published his work with the title "*Lithotomia Douglasiana*"—a title savouring of self-praise. Douglas was the first surgeon in England to perform the suprapubic operation, though the credit is more often given to Cheselden. He was the brother of James Douglas the anatomist, who wrote a description of the peritoneum in 1730, and whose name still survives in anatomical nomenclature (the pouch of Douglas and the semilunar fold of Douglas). John Douglas bitterly accused Cheselden of plagiarism, with the result that the latter dropped the high operation (he performed nine of these operations without a death) and devoted his time and energies to the development of the lateral operation. He studied the anatomy of the perineum, and in 1727 published a work on "The Lateral Operation for Stone", in which the Frère Jacques operation was for the first time put on a sound anatomical basis and brought to the pitch of perfection. Cheselden was accustomed to extract the stone in about half a minute to two minutes. On March 27, 1725, he performed the operation in one minute fifteen seconds, and on numerous occasions performed lateral lithotomy in fifty-four seconds.

Cheselden's operation was performed practically without modification for more than a century after his death. With the discovery of anaesthesia and antisepsis it was superseded by lithotomy and suprapubic lithotomy. Prior to 1720 English surgeons had taken practically no interest in "stone", and contributed nothing to the advancement of this branch of work. Swift Joly puts it as follows:

But in 10 years the whole aspect was changed. Thanks to the surgical acumen of Cheselden and John Douglas, backed by the anatomical researches of his brother James, both the High and Low operations for stone were put on a sound anatomical basis (and have remained practically unchanged ever since). . . . It was a truly remarkable piece of work, yet it was performed by three men in less than a decade. . . . The approach to the bladder in the "High" operation was, as the principal mode of access for lithotomy, fated to wait for 150 years before its employment. Why this dormancy? The answer is that a suprapubic cystotomy is a difficult and dangerous operation unless the parts are relaxed by anaesthesia. When the patient is not anaesthetised his recti are strongly contracted, and his struggles and straining force the peritoneum downwards in front of the bladder into the wound area. On the other hand the patient's struggles would rather tend to decrease the difficulties of a perineal operation, as they would have the effect of forcing the stone down towards the field of operation. In addition to this in the lateral operation there are no powerful muscles, like the recti, to grip the finger when seeking entrance to the bladder.

Since the advent of anaesthesia the suprapubic has completely superseded the perineal route. Although John Douglas was the first to perform a suprapubic lithotomy, he was not the first to point out this approach to the bladder. About 1680 Rousset described the operation, which, however, he had performed only on the cadaver. He distended the bladder, cut down on it between the short muscles (pyramidales) and opened it by plunging the knife backwards and slightly downwards towards its neck. He mentions that if by any chance the intestines escaped into the wound they must be replaced immediately—a manœuvre easy of performance in the cadaver, but profoundly difficult in the struggling, straining patient of the day. He regretted that he had not had an opportunity of operating on the living owing to the death of Henry III, who had promised him four felons condemned to death. They were to be given the choice of undergoing the operation or having their death sentences carried out. Rousset, who had been highly successful in a series of cases of Caesarean section, was led to the consideration of suprapubic lithotomy from his experience of the obstetrical operation. Morand was the first surgeon to perform the high operation in France (1727). It was he who tilted the operation table so that the patient lay in the Trendelenburg position, thus rendering prolapse of the intestines less likely were the peritoneal cavity accidentally opened. This important innovation was forgotten for about one hundred and fifty years, when it was revived by the famous German surgeon.

At this stage it is appropriate to refer to prostatectomy performed in the course of lithotomy. This was first done by Amussat in 1827. However, it was not until 1880 that removal of a portion of an obstructing prostate was first advocated by Dittel, but this operation was not performed until 1885. Lithotomy, median and lateral, was a blind operation, but in each case the prostate and the prostatic urethra were in the field of operation. Down the years, the number of cases of lightning lithotomies in which portions of the prostate were removed must have been very large. In most cases it was accidental, a pedunculated middle lobe being caught in the angle between the blades of the lithotomy forceps and torn away. In other cases a rounded adenomatous mass was shelled out from its bed under the pressure of the finger or instruments. More rarely the lateral lobes were torn away, as in the case recorded by Dittel: while he was extracting a calculus by the median perineal route, at the third attempt to grasp the stone he pulled out both lateral lobes of the prostate with the stone.

In 1883 so great a urological authority as Sir Henry Thompson summed up the applicability of operations for chronic hypertrophy of the prostate in these words:

I cannot say, however, that I have yet seen a case in which it has appeared at all advisable to practise any of these operations. So much can be done by maintaining the bladder in a healthy condition by means of the catheter that the case must be rare indeed in which such an operative procedure is indicated. In estimating these proposals most English surgeons will be content with awaiting further experiences in the hands of those who have hitherto seen fit to adopt them. We can cherish little hope that any benefit will be conferred on the patient by such methods, even granting the possibility of carrying them into execution.

Within five years this doleful opinion and prophecy were to be partially refuted by the work of McGill in England and of Belfield in the United States.

Arthur Fergusson McGill was a godson of Sir William Fergusson, the distinguished King's College Hospital surgeon, and hence he bore his name. He studied at King's College Hospital and was admitted to membership of the Royal College of Surgeons of England. He filled his term of office at King's College Hospital with conspicuous surgical ability and success. In 1869 he was appointed resident medical officer to the Leeds General Infirmary. He decided to continue his surgical career at Leeds, and in 1874 he became a Fellow of the Royal College of Surgeons of England and was appointed demonstrator of anatomy. Primed with anatomical knowledge, he ligated

the first part of the left subclavian artery in the thorax for a recurrent aneurysm. This marked him out at once as an able surgeon of great original powers. In 1882 he was appointed first honorary assistant surgeon and in 1884 he became full surgeon. The reputation of the Leeds Infirmary as a school of practical surgery was ably maintained by him. During the first four or five years of the revival of suprapubic cystostomy, he originated and with success performed suprapubic prostatectomy. It was in 1886 that symptoms of diabetes, before undecided, became only too certain. He knew that the disease would probably run a rapid course, as his mother and a brother had died from the same malady, but he resolved steadily to continue his work until the end should come. He died in coma on November 21, 1890, three weeks later than the great pioneer surgeon Henry Jacob Bigelow, of Boston, Massachusetts, who revolutionized lithotrity and the treatment of dislocation of the hip. McGill's teaching was conspicuous for its directness and simplicity. All who knew him valued his professional enthusiasm, his devotion to work and the transparent honesty and single-mindedness of his character.

McGill read his first paper on the subject which made his reputation at a meeting of the Clinical Society of London on November 19, 1887. It was entitled "The Surgical Treatment of Enlarged Prostate". He related three cases in which the operation had been successfully performed. The operation consisted in opening the bladder above the pubes in the usual way and removing with scissors and forceps that portion of the enlarged prostate which prevented the outflow of urine. In McGill's first case urinary symptoms had been present for seven years, and the patient had not been able to pass urine without a catheter for seven months. A portion of prostate as large as a walnut was removed. The patient made a speedy recovery and thereafter did not have to use a catheter. The second patient had had symptoms of prostatic enlargement for two years, and acute symptoms for a fortnight. Fetid urine and frequency of micturition were present. He was treated for three weeks by the ordinary methods. The middle lobe of the prostate, the size of a bean, was removed with immediate benefit. He left the hospital on the twenty-seventh day passing urine without difficulty. The third patient had had prostatic symptoms for six years, and acute symptoms of greater or less severity for three years. On his admission to hospital he was found to be extremely ill. He vomited all his food, had constant diarrhoea, and passed putrid urine which deposited one-third of its bulk of pus. When an opening was made into the bladder, the ureters were found to be much dilated. The projecting portion of the enlarged prostate was removed. He made a quick and satisfactory recovery and was able to micturate without difficulty.

The benefits derived from what McGill admitted was a partial prostatectomy were, he stated, of two kinds: first, acute symptoms were relieved by drainage of the bladder; second, the cause of those symptoms was removed by excision of a portion of the enlarged prostate. Until then the operation had been practised only in acute and urgent cases. "It is not improbable", McGill prophesied, "that in future it may be resorted to before any acute symptoms intervene."

In the discussion which followed, Mr. Christopher Heath among other remarks said that "McGill's mode of treatment may be said to have opened up a great field for enterprising surgery". And Sir Henry Thompson agreed that "McGill's operation was a fresh starting point and he should further enquire into it". He was disposed to think that the suprapubic method was better than the perineal.

McGill's second communication was published in *The Lancet* of February 4, 1888—"Hypertrophy of the Prostate and Its Relief by Operation". In this lecture he mentioned the three forms of enlarged prostate with which he was familiar. He stated that the orthodox treatment of enlarged prostate might be described in a few words.

Teach the patient how to pass a soft catheter for himself and let him pass it once or twice daily. When this treatment is successful nothing more is required. Many patients live for years and beyond the slight

annoyance of the daily catheterism have no further discomfort. But unfortunately this is not always so. The treatment not infrequently breaks down. From some cause or other (want of care in cleaning the catheter) the urine becomes thick and offensive, intense desire to empty the bladder and inability to do so, necessitate a more frequent catheterism till rest is constantly disturbed and death is rendered imminent. In another class, from delay in seeking surgical aid the symptoms become urgent with the retention of urine and its suffering. The surgeon passes a catheter, but fails in his endeavour to teach his patient to do so.

In these circumstances McGill advocated the trial of a new operation, suprapubic prostatectomy. He said that (i) the pedunculated middle lobe could obviously be removed with ease, its pedicle being divided with curved scissors; (ii) a sessile middle lobe could be removed in the same way, the scissors being helped by tearing with forceps; (iii) the collar enlargement was removed with greater difficulty. It was, he said, advisable to divide the collar enlargement longitudinally by inserting one blade into the urethral opening and dividing the portion above and then passing the other blade into the same opening and dividing the tissues below. The two lateral halves could be removed separately by scissors curved on the flat, or enucleated with the tip of the first finger. Care must be taken not to leave any portion of the projecting valve behind.

Later, at a meeting of the British Medical Association at Leeds on August 24, 1889, McGill opened a discussion on "Treatment of Retention of Urine from Prostatic Enlargement". He advocated the following propositions: (i) that prostatic enlargements which gave rise to urinary symptoms were intravesical and not rectal; (ii) that retention of urine was caused by a valve-like action of the intravesical prostate, the urethral orifice being closed more or less completely by the contraction of the bladder on its contents; (iii) that in many cases self-catheterization was the only treatment required; (iv) that when the catheter treatment failed or was unavailable more radical measures were necessary; (v) that this treatment to be effectual should (a) for a time thoroughly drain the bladder, (b) permanently remove the cause of the obstruction. The suprapubic operation was preferable, (a) because it was more generally applicable, (b) because it could be performed with greater precision and completed with greater certainty, (c) because it ensured complete and most efficient drainage and (d) because it was equally safe.

Of ten patients on whom the speaker had operated, eight had continued well, only one having required the passage of a catheter, and that after excessive drinking. Another had had temporary relief with death at the end of ten months.

In the discussion which followed, Mr. Reginald Harrison considered that "McGill's operation would occupy a permanent place in connection with the surgery of the urinary organs".

Mr. (later Sir William) MacEwen said that, after hearing Mr. McGill's paper and seeing his patients in the Leeds Infirmary and the specimens, he had upon this evidence become a convert to the suprapubic removal of the prostate as it removed the pathological cause of the difficulty. He would put the operation into practice at the earliest suitable opportunity.

All the statements of McGill which I have quoted refer to enlargement of the middle lobe, but it is certain that McGill enucleated the following: (i) in October, 1887, a growth the size of a cricket ball attached to the right lobe; (ii) in December, 1887, lateral lobes enlarged so as to measure two inches in their vertical diameter; (iii) in February, 1888, lateral lobes much enlarged, which weighed over two ounces; (iv) in December, 1888, portion of a prostate weighing over two ounces.

Although it is obvious from McGill's own published statements that his remarks applied to the enlarged middle lobe and its action as a ball valve, there is no doubt whatever that he enucleated lateral lobes in whole or in part. I feel justified in saying that but for his early and tragic death further experience would have led him to

anticipate Eugene Fuller in the operation of complete suprapubic prostatectomy.

In 1890 (the year in which McGill died), W. J. Belfield of Chicago published his views, which were based on his own operative experience and that of McGill. He stated that "the rise of vesical surgery in the last decade furnished among its early achievements the complete relief of prostatic cystitis by temporary drainage of the bladder, now a standard operation". He was, however, far from satisfied with the position. He went on as follows:

The relief so obtained is of uncertain tenure; the factors which originally induced the malady remain undisturbed; they may, and as experience shows they often do, cause a recurrence of the vesical inflammation. A rational procedure should aim to secure not merely a cessation of existing cystitis, but also by removal of the cause, prevention of its recurrence—a radical instead of a palliative operation.

The theory of radical operation assumes that the cause of chronic retention is mechanical obstruction by the enlarged prostate; that such prostatic obstacles are capable of removal, and that after such removal the bladder will resume its function of voluntary evacuation.

Belfield asserted that many cases are not susceptible to operation by perineal urethrotomy as the finger often fails to explore the vicinity of the vesical orifice. He quotes McGill's observation that in only three of 12 cases would it have been possible to remove a projecting portion of the prostate by the perineal route. Belfield instanced a fatal case of his own, in which was found at autopsy a median prostatic tumour of the size and shape of a walnut with a relatively small attachment. It could have been readily removed by suprapubic cystotomy, a fact which induced him to adopt this incision in subsequent operations. He remarked that the suprapubic incision had the advantage of being applicable to every case. He stressed that the object should be to restore a low level channel through the prostate (he had evidently noted the prostatic pouch so often present), and to this end he urged exploration of the urethral surface, which was as important as that of the vesical surface of the prostate.

He wisely remarked that the failure to recover vesical function after the suprapubic operation might have been due to neglect to recognize urethral obstacles. To the claim of Watson, a "perineal" advocate, that "in two-thirds of the cases a radical operation with that approach can be performed by anyone with an index finger of at least three inches in length", Belfield tersely observed: "It is unwise to commence an operation with the probability of failing in one-third of the cases, and it is not advisable to limit the ability to perform an operation to gentlemen with preternaturally long fingers."

Belfield insisted that the operation of suprapubic prostatectomy should be performed earlier and not as heretofore delayed until the last stage. He supported this with the statement that operations on the prostate complicated with calculus furnished a much smaller mortality—3.8%—than the uncomplicated prostatectomies—17.5%. The calculus which compelled an earlier operation was an advantage rather than an evil.

He remarked, with a foresight which supported McGill's, that "in time patients will be educated to the knowledge that danger lies not in the operation but in the delay whereby the urinary organs are disorganised".

Regarding the case of another surgeon in which a new growth appeared near the site of removal of a median enlargement, Belfield remarked:

An important deduction from these considerations is the indication for thorough enucleation of all circumscribed masses within as well as above the general prostatic surface. Such tumours can be enucleated after incision of the mucous membrane with surprising facility. McGill especially has demonstrated the feasibility of this measure in many cases of his extensive experience.

Belfield's technique consisted in placing the patient in a modified Trendelenburg position in order to eliminate the peritoneal fold from the field of operation. With the patient in the inclined position, an almost empty bladder

can be opened with safety. Belfield held that an important advance in the removal of prostate obstruction consisted in the enucleation of all accessible masses in the substance of the organ instead of a simple levelling off of projecting tumours by scissors or cautery. By this means not only the salient middle lobes, but also the no less obstructing, though less obtrusive, lateral enlargements are easily removed. In regard to this procedure Belfield said that McGill deserved special mention; in several instances he had enucleated lateral masses weighing from half an ounce to two ounces. It is of some interest, in view of Freyer's claim ten years later (1901), that Belfield remarked in regard to the use of the term "prostatectomy": "The obvious etymological inaccuracy of this term is still of slight moment, since the real 'prostatectomy' extirpation of the entire prostate is as yet a rare experiment."

In England the last ten years of the nineteenth century were marked by little progress on the lines laid down by McGill and Belfield. That was not the case in the United States. Eugene Fuller of New York in 1885 published a description of the operation performed by him in the treatment of hypertrophied prostate.

The bladder is opened suprapubically. The left forefinger is then introduced into the bladder, the location and extent of the prostatic obstruction determined and the vesical opening located. Guided by the forefinger to the urethral opening rough serrated edged scissors held in the right hand incise the bladder wall from the lower margin of the vesical opening of the urethra backwards for an inch to an inch and a half. Then one of the forefingers, whichever the operator may find the more convenient, is slipped through this vesical incision, while at the same time the fist of the other hand makes firm counterpressure against the perineum. This brings the prostatic growth well into reach of the forefinger of the other hand which is employed all this time in enucleating the prostatic obstruction *en masse* or piece by piece as the case may be. This enucleation can be easily and speedily accomplished in this manner, and should not be desisted in until all the lateral and median hypertrophies as well as all hypertrophies along the line of the prostatic urethra have been removed. It will be found the little cut made through the bottom of the bladder will be large enough to admit of the passage through it of the enucleated prostate.

A perineal section is then made and a large size (26 American) soft rubber tube is passed through a perineal cut and the cut through which the prostate was enucleated into the bladder. After this hot water irrigation is employed for some minutes to wash out blood clots and to stop oozing. Then the suprapubic wound is closed by a deep layer of catgut sutures which include the bladder wall and by a more superficial layer of silkworm gut sutures. About the middle of the cut the catgut stitch is omitted and a deep silkworm gut suture is taken which includes the vesical walls and the whole extent of the lateral abdominal wall. This is not tied at the time of the operation, thus allowing a rubber suprapubic drainage tube to temporarily remain in position. This tube may be removed in four or five days and the silkworm gut suture tied. It is best not to remove these sutures till after the patient is up and about as there is often times a tendency for the soft scar tissues of the wound to give, thus allowing considerable spreading of the abdominal structure. . . . My first case of enucleation was performed early in May, 1894.

I can say of my method of enucleation that by it the prostatic hypertrophy can be easily and thoroughly removed without damage to the structures comprising the vesical neck and that hæmorrhage resulting from it has always been of little consequence. Owing to the slight amount of bleeding I have always found it feasible to sew up as I have described the suprapubic cut and I have never experienced trouble from secondary hæmorrhage.

In speaking of results I have this to say—In almost all cases also the use of the catheters can be entirely dispensed with after convalescence from the operation is wholly established, the apparently atonied bladder gradually regaining its muscular force until finally it throws off a full forcible stream. In many instances previous evidences of renal troubles due to pyelitis caused by dilatation of ureters and pelvis gradually disappear as those muscular structures also in like manner as the bladder regain their tone. As a result

the patient at the end of 6 months or a year after the operation is apt to report hale and hearty—declaring that he feels 10 years younger and that his act of urination is all that he could desire.

If all the hypertrophies, median, lateral and round about the prostatic urethra are removed, as they should be and as they can be, by adopting the method I advocate, then I claim that the results, as far as the bladder is concerned, are, barring mortality, satisfactory.

In the spring of 1900 Fuller's book "Diseases of the Urinary System" was published. In this book, which was published before Freyer's article on "Complete Extirpation of the Enlarged Prostate" (1901), Fuller incorporated his 1895 paper quoted by me.

Progress in direct surgical attack on the enlarged prostate was delayed by an alternative procedure advocated by Dr. J. William White, professor of surgery at the University of Pennsylvania, in 1893. The fact that eunuchs do not develop enlargement of the prostate was seized upon by him as a rational basis for the removal of the testes in patients with enlarged prostates causing obstruction to urination. As a less mutilating alternative, Reginald Harrison of Saint Peter's Hospital, London, suggested vasectomy. What applies to the prostate of the eunuchs does not apply to the adenomatous enlargement of the elderly and old man. The obstruction was relieved in the first cases in which castration was used. The fact was immediately bruited abroad that at last a simple means to combat this ancient infirmity had been found. However, the beneficial results of castration were only temporary, and in a short time the operation fell into disuse, but not before thousands of testes had been sacrificed. Castration was performed on several patients when I was a medical student at the Adelaide Hospital in the nineties. The reason why castration in some cases succeeded in relieving the prostatic obstruction was due to the fact that 14% to 20% of patients with prostatic obstruction have a cancerous prostate. Castration of such patients at the present day frequently confers great temporary benefit.

As an indication of what was in the minds of surgeons in 1870, Mayo Robson wrote: "The position has for a time turned from prostatectomy to castration in the operative treatment of enlarged prostate, but I am by no means converted." Events to be mentioned later prove that he remained unconverted. It is unquestionable that between 1895 and 1901 prostatectomy was largely in abeyance. The time was ripe for a surgeon of standing to disperse the mist of uncertainty which enveloped the issue. That man proved to be Mr. (later Sir) Peter Johnston Freyer. He was born on July 21, 1857, and died in September, 1921.

In 1872 Freyer graduated in Arts at Queen's University, Ireland, with first-class honours and the gold medal. In 1874 he took the degrees of Doctor of Medicine and Master of Surgery at Queen's University, again winning the gold medal. He gained first place in the examination for the Indian Medical Services in 1875. In 1897 he was appointed surgeon to Saint Peter's Hospital for Stone, Henrietta Street, London, where his portrait by Orpen now hangs. He made popular—I will not say originated—the operation of complete prostatectomy through a suprapubic incision of the bladder. He performed his first operation on November 21, 1900.

Freyer (1901) after referring to methods of treatment of hypertrophy of the prostate which had been advocated, and their unsatisfactory nature, said: "At the present time catheterism pure and simple with all its drawbacks and disadvantages, reigns supreme in the practice of most surgeons as the least objectionable of all."

Freyer concluded his lecture (1901) with these words:

I submit that the complete success with which they have been attended opens up a new and promising era in this field of surgery with far-reaching results. I submit that the thoroughly successful results obtained in these four cases of total extirpation of the enlarged prostate encourages us in the hope that we have at last arrived at a rational method of dealing with this painful and frequently fatal malady. These four operations have completely revolutionised my views with regard to the treatment of this painful and widespread malady.

The results of his first 1000 cases were published in 1912.

Freyer's comments on the various methods of treatment of prostatic obstruction prior to 1901 fail to do justice to the work of Belfield and McGill, who advocated enucleation of, and in several cases enucleated, the lateral lobes of the prostate.

From time to time various methods of so-called radical cure by partial prostatectomy, whether by the urethral, perineal, or suprapubic route, have been introduced. Partial prostatectomy by the suprapubic route, first performed by Belfield, of America, but best known in this country in connection with the name of McGill, who first brought it prominently before the profession in 1888, was the most reliable, as most commonly applicable and on the whole most satisfactory in results.

The Belfield-McGill operation consists in opening the bladder suprapubically and removing the outgrowth into that viscus or as much of it as possible by scissors, forceps and the finger.

Freyer stated that he had performed this operation with considerable success, but he further stated that apart from the mortality attending the procedure, in a large proportion of cases the bladder failed to regain its expulsive power.

This failure is due to the fact that the outgrowth into the bladder is not the only source of obstruction, which is mainly due to pressure on the urethra by lateral lobes.

There are other facts to be considered before Freyer's claim to be the originator of total prostatectomy can be conceded.

In August, 1900, Dr. Ramon Guiteras of New York read his paper "The Present Status of the Treatment of Prostatic Hypertrophy in the United States" before the International Medical Congress in Paris. On his way to attend the Congress Dr. Guiteras called on Mr. Freyer at Saint Peter's Hospital, London.

In a letter to Dr. Fuller, written some time later, Dr. Guiteras explains what took place.

Dear Doctor—I read a paper entitled "The Present Status of the Treatment of Prostatic Hypertrophy in the United States" in the Section of Urinary Surgery of the International Medical Congress in Paris, August 4, 1900. In this paper I explained the different methods that are employed in operating on the prostatic gland in this country. An abstract of this paper was published in the Transactions, but the paper in full came out in the New York Medical Journal, December 8, 1900. I had the pleasure of meeting Dr. Freyer in London prior to August 4, 1900, on my way to Paris, and explained to him your method of enucleating the prostate that you had been using for a number of years, and which I had followed except that I introduced my fingers into the rectum for the counterpressure instead of pressing on the perineum. Dr. Freyer was very much pleased with the description of the operation, and said that he would try the method. Since then he has operated a number of times, but describes his operations as though he had originated the operation of suprapubic prostatectomy which had been performed for so many years previously by other operators. I am sending you a reprint of the Paris paper.

Yours sincerely,

RAMON GUITERAS.

Freyer's first suprapubic prostatectomy was performed at Saint Peter's Hospital on November 21, 1900, shortly after Guiteras's instructive visit, and Freyer, showing himself an apt student, operated successfully following the method taught him by the New York surgeon. Seven months later, on June 26, 1901, Mr. P. J. Freyer delivered a clinical lecture on "Total Extirpation of the Prostate for Radical Cure of Enlargement of that Organ" before the Medical Graduates' College, London. This lecture appeared in the *British Medical Journal* of July 20, 1901. But nowhere was the operation described as other than new and original with the lecturer.

From many surgeons in England and from Fuller himself, letters in violent protest were published in the *British Medical Journal*. Mr. Mayo Robson protested against Freyer's claims and drew an acrimonious reply

from him. Mayo Robson, in the *British Medical Journal* of August 10, 1901, in answer referred to enucleation practised by Dr. McGill and said that the operation claimed to be original by Freyer had been described by Dr. Fuller in his paper in the *Journal of Cutaneous and Genito-Urinary Diseases*, Volume VIII, 1895. Mr. Freyer, in answer to the preceding letter of Mayo Robson, said (1901b): "The communication of Fuller referred to I regard as a valuable contribution to the surgery of the prostate. It exemplifies a further step in the operation of McGill and Belfield. But his operation is purely a partial prostatectomy whereas in my operation the whole prostate is enucleated in its capsule and stripped of the urethra, thus obviating severe hæmorrhage and securing permanent immunity from recurrence of the disease." He concluded by saying that perineal section for drainage was not performed in his operation.

Fuller charged Freyer with having made a statement largely false or skilfully misleading. Fuller insisted that he removed the entire prostate, and not, as Freyer falsely asserted, only the nodules within the capsule. The pictures illustrating Fuller's article, showed, he said, that he removed the same amount of capsule and the same amount of hypertrophied tissue as Freyer. The making of a perineal puncture for drainage in the after-treatment was one special detail in which Freyer did not follow Fuller, who rightly said that the step had really nothing to do with the actual removal of the prostate, but was a feature of the after-treatment.

Fuller's reply to Freyer's original article (1901a) appeared in the *British Medical Journal* on August 24, 1901. He wrote: "On first glancing it over I thought that Mr. Freyer was announcing himself as one of my disciples so closely did he follow my footsteps. But on closer reading I failed to find any acknowledgement of my tutelage." After giving references to his work he closed as follows: "I think you will find in my method of prostatic enucleation practically everything to which Mr. Freyer lays claim."

Freyer took no notice of Fuller's letter. D. F. Keegan had on the appearance of Freyer's first article written a congratulatory letter to the *British Medical Journal* concluding in these terms:

The clinical lecture heralds a new and most promising epoch in operative surgery. We, one and all of the Indian Medical Service, feel proud that it should have fallen to the lot of a member of our service to have made this great and important advance in the surgical treatment of enlargement of the prostate.

After the appearance of Fuller's letter, Keegan read his work, and then wrote as follows to the *British Medical Journal* of October 26, 1901:

In modification of the letter which appeared above my name in the B.M.J. of August 3rd, I would like to say that, having read Dr. Fuller's work "Diseases of the Genito-Urinary System", I am of the opinion that in his operation designated the "direct removal of prostatic obstructions", Dr. Fuller had in principle anticipated him by some years.

Further, Keegan in a private letter to Fuller wrote with greater emphasis:

I have accorded you your just due for being the first to deal in a natural and scientific manner with enlargement of the prostate.

This handsome withdrawal of the credit Keegan had given to Freyer was most satisfying to Fuller.

Whatever view is taken of priority, it cannot be denied that Freyer did immense service by making popular the operation of suprapubic prostatectomy—an operation which has added comfortable years of health to the lives of many thousands of sufferers. The Freyer suprapubic operation is, as its author's description proves, a "blind" operation, and it has earned its name. "Blind work is bad work", I once heard Howard Kelly of the Johns Hopkins Hospital say. No pronouncement is wiser than that of Stephen Pilcher, sometime editor of the *Annals of Surgery*, and father of the urologist who designed the Pilcher compression bag used in prostatectomy: "There is surely nothing in the special conditions of the prostate to

take its surgery out of the application of that tenet of general surgery which demands the adequate exposure of the affected part as the first step to any attack on it." Imbued consciously or not by this dictum, some surgeons from the advent of the twentieth century sought to remove the reproach of "blind" from the Freyer operation, and to remedy other defects. Others sought to attack the enlarged prostate by an alternative route.

Classification of the Operations of Prostatectomy.

I. Suprapubic.

1. Intravesical enucleation.
 - (a) The "blind" operation (Freyer, 1901).
 - (b) The "open" operation with suprapubic drainage (Thomson Walker, 1928).
 - (c) The "open" operation with reconstruction of urethra, complete closure of bladder and urethral drainage only (Harry Harris, 1929).
2. Complete intravesical extirpation of the prostate by diathermic dissection with closure of the bladder (Wilson Hey).
3. Prevesical or retropubic enucleation with complete closure (Millin, 1945).

II. Perineal.

1. Enucleation with packing of prostatic cavities (Hugh Young, 1903).
2. Enucleation with obliteration of prostatic cavity and reconstruction of urethra (Winsbury-White).

III. Perurethral Resection.

1. Electrocauterizing prostatic punch (Hugh Young, 1902).
2. Resectotome with diathermy loop (McCarthy and others).
3. Resecting cutting punch (Braasch-Bumpus, Gershon Thompson). Subsequent diathermic hæmostasis.

In 1928 Thomson Walker introduced the "open" operation with the following features: (i) a long suprapubic incision; (ii) enucleation without a finger in the rectum; (iii) free exposure by means of wide instrumental retraction with the patient in the Trendelenburg position; (iv) removal of all shreds, tags and nodules after enucleation; (v) provision of a wide opening from the bladder into the prostatic cavity; (vi) control of hæmorrhage by suture, ligature or packing; (vii) retention of a catheter in the urethra with continuous or intermittent lavage of the bladder and prostatic cavity.

The Harry Harris Operation.

The Harry Harris operation (1929) with closure of the bladder was a further stage in the application of surgical principles. After enucleation of the prostate under bright electrical illumination, hæmorrhage is minimized by the use of a trigonal tongue-shaped flap to fashion a vesical junction with the distal remnant of the prostatic part of the urethra. The trigonal flap also satisfies the principle of covering a raw surface with mucosa. A figure-of-eight stitch controls hæmorrhage from the edges of the opening into the prostatic cavity and helps to complete the fashioning of the vesico-urethral junction around a rubber catheter. The suprapubic wound is completely closed except for a small tube at the upper end of the incision in the bladder. The urethral catheter is retained until the suprapubic incision has healed. The operation of Harry Harris marked a great advance in suprapubic prostatectomy, the merits of which surgeons overseas were slow to recognize.

At the centenary meeting of the British Medical Association in London in 1932, in the discussion on prostatectomy I commended the Harry Harris operation; but I added that it was opposed to a surgical principle to believe that primary union between the bruised and lacerated mucosa of the bladder and urethra followed his reconstruction procedure. On my return to Australia Harry Harris wrote to me taking exception to my criticism. However, Clifford Marson, in association with J. E. Semple (1934), with the aid of the posterior urethroscope has shown that at the end of the sixth week there is still non-union between the mucous membrane of the bladder and that of the urethra.

Suprapubic Prostatectomy (Wilson Hey).

Wilson Hey's suprapubic prostatectomy is claimed to be "the simplest, easiest and possibly the safest of all prostatectomies yet devised". It has some novel features: (i) It is not an enucleation, but an almost total prostatectomy with a trigonectomy and a removal of part of the seminal vesicles. (ii) The use of an indwelling catheter in the pre-operative treatment is anathema to Wilson Hey, who regards it as a highroad for sepsis. Reliance is placed on sulphadiazine and penicillin. The catheter or tube introduced *per urethram* for drainage of the bladder after operation is removed on the second day. (iii) Only one special instrument is required—a finely pointed Spencer Wells artery forceps and needle connected to a diathermy apparatus. No ligatures are used. Every bleeding vessel is minutely sealed with the fine points of the diathermy forceps. (iv) The incision in the bladder wall is closed in three layers.

Retrobulbar Prostatectomy (Millin).

Millin's retrobulbar prostatectomy was first performed by him in August, 1945. He admits that analogous but essentially different operations had previously been performed by Van Stockum, by Maier and Casper and by Jacobs. He considers that the ease of the approach and the easy convalescence make the operation widely applicable in the great majority of cases of prostatic obstruction. Through a vertical mid-line or transverse suprapubic incision a prevesical approach is made to the retrobulbar space. After a good exposure of the prostate and diathermic haemostasis, a transverse incision one centimetre beyond the bladder neck is made through the endopelvic fascia and true and false prostatic capsules. The capsule above and below the incision is stripped from the exposed adenomatous mass by long scissors curved on the flat. The urethra is divided with scissors as far proximally as possible, and digital enucleation of the adenoma is completed. A rubber catheter is passed into the bladder via the urethra, the prostatic capsule is sutured, and the suprapubic incision is closed after a small corrugated drain has been placed in contact with the capsular suture line.

Perineal Prostatectomy (Hugh Young).

In "A Surgeon's Autobiography", Hugh Young of Baltimore tells the story of the origin of his perineal operation, an account of which he published in 1903. He states that a patient from Hawaii consulted him and said that he had read all that he could get hold of on prostatectomy, and that he liked what Young had written and had come to him for relief: "I honestly think that you have not yet got the perfect method. Could you not give me something better?" Young replied that he had in mind a new method of attack, and asked if the patient would be willing to wait while he made instruments with which the operation could be performed more effectively and safely than ever before. The patient was glad to wait. Later on Young showed him the instruments which he had devised, sketched the condition of the prostate, and explained what he proposed to do. On October 8, 1902, Young performed the operation with success. He comments: "It seemed to me that the ideal method had been found to remove enlarged lobes from within the prostate. It was my patient's insistence that brought action and my indebtedness to him is great." Stated briefly, the operation consists of the following steps: (i) the making of an inverted V incision in front of the rectum; (ii) urethrotomy posterior to the bulb and the passing of a two-bladed tractor into the bladder; (iii) traction on the prostate and exposure of its rectal surface; (iv) incision of the prostatic capsule and condensed prostatic tissue and enucleation of the lateral lobes and middle lobe.

Young performed the operation many hundreds of times with a very small death rate. His success inspired his friend E. L. Keyes to make the punning comment: "The prostate makes most men old, but it made Hugh Young." I saw him perform the operation on a dozen occasions at Baltimore in 1907 and 1908. The precision and apparent ease of performance were a liberal education and a delight to witness.

Winsbury-White's Modification of Hugh Young's Perineal Prostatectomy.

Winsbury-White's modification of Young's operation consisted in abolition of gauze packing of the prostatic cavity and in reconstruction of the urethra.

Perurethral of Transurethral Resection of the Prostate.

With the advent of the twentieth century, interest in the trans-urethral approach to the obstruction was awakened by two scientific advances: the perfecting of the irrigating cystoscope and the surgical use of high-frequency currents. In 1876 Bottini described his electro-cautery operation, which was a blind and crude procedure. It was little used until 1897, when Freudenberg, operating with an improved instrument, published a large number of successful cases. Hugh Young improved the Bottini instrument still further, and during the three years prior to the introduction of the perineal operation bearing his name used his modification of the electro-cautery in a considerable number of cases. Imperfect results and an occasional death caused him to switch to perineal prostatectomy.

Two quite different procedures are now employed. (i) An indirect vision cystoscope is used in association with a cutting loop activated by a diathermic cutting current (McCarthy resectoscope). This method entails an unseen amount of necrosis in the prostatic tissue left behind, with possible sepsis as a sequel. The necrosis may involve the external sphincter, with resulting incontinence of urine. (ii) A direct vision cystoscope is used in association with cutting knife or punch, the latest form of which (Gershom Thompson) permits of rapid resection without necrosis. Haemorrhage is controlled by transmitting a coagulating current through a diathermy electrode. Post-operative sepsis is less after punch resection, and damage to the external sphincter is avoided.

Conclusion.

This sketch of the evolution of prostatectomy is evidence that the millennium is not yet. Nevertheless it is certain that benefits inestimable have been conferred on sufferers from prostatic obstruction since Bancroft in his day "was among the best in the use of the catheter".

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PROCAINE PENICILLIN: ITS EFFECTIVENESS IN MAINTAINING BLOOD LEVELS, AND ITS USE IN THE TREATMENT OF GENERAL PARALYSIS OF THE INSANE.

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WITH AN APPENDIX BY HELEN FOSTER,

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Efforts to prolong the effect of a single injection of penicillin have gradually evolved more suitable preparations for the treatment of diseases such as neurosyphilis, which require the prolonged maintenance of effective levels of penicillin in the blood. Thus a series of preparations—namely, aqueous solutions, the Romansky preparation in peanut oil and beeswax, and procaine and other salts of penicillin—have been given a trial. Then appeared the preparation used in the present trials—namely, procaine

penicillin G in peanut oil, gelled with 2% aluminium monostearate solution. Further technical improvements in this substance can be obtained by reducing the particle size.

Early reports on the use of penicillin in the treatment of neurosyphilis include those by Stokes *et alii* (1944), and an interesting article with useful references by Koteen *et alii* (1947). Reports in the literature fall naturally into two groups, according to whether penicillin was used alone or as part of multiple therapy, and these groups again may be divided into experimental and clinical observations.

Experimentally, it has been shown (Eagle *et alii*, 1947; Fleming and Holcombe, 1948) that the efficacy of penicillin is heightened by pyrexia, and striking demonstrations of the efficacy of penicillin against the *Treponema pallidum* in rabbit syphilis and in human "ping-pong" syphilis have been reported (Arnold *et alii*, 1947).

Clinically, reviews of more extensive experience with penicillin in neurosyphilis have been published by Stokes *et alii* (1948), and by Worster-Drought (1947), and Lescher and Richards (1947). There has been a weight of opinion favouring the conclusion that penicillin therapy with malaria is more effective than penicillin alone; this in turn is more effective than malaria with chemotherapy.

In view of the facts and opinions expressed in the current literature, and particularly the lack of unanimity and certainty, a programme of investigation was planned for the treatment of patients suffering from neurosyphilis under my care, first at the Mental Hospital, Parkside, and then during the past year at the Receiving House, Enfield.

To begin with, the course of treatment was designed to use all potent antisyphilitic agents. After adequate "Bismecol" (liposoluble bismuth, May and Baker) and iodine had been given to minimize Jarisch-Herxheimer reactions, malaria was induced; then, during the course of fever, tryparsamide and Römansky penicillin were given. Good results were obtained, as judged clinically and by cerebro-spinal fluid tests; but Herxheimer reactions were unduly frequent in the optic nerve.

The second stage of the programme began with the arrival, in February of this year, of our first supplies of procaine penicillin G in peanut oil, gelled with 2% aluminium monostearate solution (supplied by F. H. Faulding Proprietary Limited, for the purpose of clinical trial). This is packed in rubber-capped 10 millilitre bottles, and great care must be taken to remove the sludge from the bottom by very vigorous shaking before withdrawal. After preparatory "Bismecol" therapy, only malarial treatment and penicillin were employed. This is the stage reached at present, and the following are the results with two cases of general paralysis of the insane.

The third stage, provided that my results and the literature support it, will be to dispense with the malaria.

Interesting articles on repository types of penicillin preparations that have been gradually evolved have appeared recently (Sullivan *et alii*, 1948; Thomas *et alii*, 1948). The efficacy of these products depends greatly upon technical skill in manufacture, particularly in determining the particle size. With procaine penicillin gelled in aluminium monostearate solution, the need has swung from large to small particles, and better repository effects have been obtained with "small particle" (95% less than 5-0 μ) than with "large particle" preparations (Thomas, 1948).

Consequently, the results obtained with one brand, or one method of manufacture, cannot be transferred to another product of procaine penicillin. A set of penicillin assays in the blood samples from two patients treated with the product made by F. H. Faulding Proprietary Limited, containing 300,000 units per millilitre of procaine penicillin G in peanut oil, gelled with 2% aluminium monostearate solution, is given in the accompanying tables.

The following routine was adopted. After "Bismecol" preparation, a test dose of two millilitres was given. Blood samples were taken for assay just before, then at twenty-four hour intervals after, the injection, until no penicillin could be detected. Then a routine intramuscular course

of two millilitres on three days a week for three weeks is given. Blood samples are taken before each injection, then at twenty-four hour intervals after the last injection, until no penicillin is detected. Subjective and objective evidence of Herxheimer reactions are sought before each injection. These occurred in some earlier cases, but, detected very early, they subsided rapidly, and penicillin was successfully continued after further "Bismecol" therapy.

The above course of procaine penicillin therapy was taken from a review by Evan W. Thomas (1948); it provides 5,400,000 units over a period of twenty-one days, and, as can be seen from the tables, an effective blood concentration for considerably longer. As Thomas points out, high peaks of penicillin level apparently mean very little, and early syphilis can be cured with little or no demonstrable penicillin in the blood, provided that there is continuous action over a long period. Tables I and II, and the detailed reports of the two cases in which the method was tried, show that continuously high levels have been maintained for long periods. Also, Thomas emphasizes that the cerebro-spinal fluid is a better guide to the efficacy of treatment than clinical results. Our clinical results have been very satisfying to the patients, to their relatives and to ourselves, and the cerebro-spinal fluid findings are shown: they parallel those obtained by others.

In collecting blood for assay, the syringe and skin must be free from methylated spirits. Syringes were boiled and steam-dried; the skin was cleansed with spirit, then swabbed freely with ether. Five to 10 millilitres of blood were placed in sterile dry bottles to clot. Several hours later the serum was drawn off, placed in another bottle, then stored and frozen in a refrigerator.

Reports of Cases.

In the first trial five tests were made. The subjects were two patients, Patient A (male) and Patient B (female).

In the first test, on March 1, 1949, one millilitre of the penicillin solution was given to Patient A by intramuscular injection. Examinations of specimens of blood taken at twenty-four, forty-eight and seventy-two hours revealed no detectable penicillin level (less than 0.02 unit per millilitre of serum). It was thought that the result might have been due to a technical fault. In the second test, on March 7, one millilitre of the penicillin solution was given to Patient A by intramuscular injection. The blood concentrations were as follows: after four hours, one unit per millilitre; after twenty-four hours, 0.06 unit per millilitre; after forty-eight hours, nil.

The third test was carried out on both patients. On March 11 each received two millilitres of the penicillin solution by intramuscular injection. Before the injection no penicillin was detectable in the blood of either patient. The blood concentrations (units per millilitre) afterwards were as follows: after four hours—Patient A, 2.0, Patient B, 0.5; after twenty-four hours—Patient A, 0.5, Patient B, 0.5; after forty-eight hours—Patient A, 0.06, Patient B, 0.25; after seventy-two hours—Patient A, 0.06, Patient B, 0.125.

The fourth test was the same as the third test, and was carried out on March 19. After the injections the blood concentrations of penicillin (units per millilitre) were as follows: after twenty-four hours—Patient A, 0.25, Patient B, 1.0; after forty-eight hours—Patient A, 0.125, Patient B, 0.25; after seventy-two hours—Patient A, 0.25, Patient B, 0.125; after ninety-six hours—Patient A, nil, Patient B, nil.

The fifth test was carried out as follows. During and after a routine course of intramuscular injections of 2.0 millilitres of penicillin solution given three times a week for three weeks, specimens of blood were taken and examined just prior to each injection, then every twenty-four hours for seven days after the last injection. The results obtained are shown in Table I.

The detailed clinical history of Patient A is as follows.

On January 17, 1949, examination of Patient A gave the following results. The cerebro-spinal fluid contained 1070 erythrocytes and 19 lymphocytes per millilitre; the fluid also contained 50 milligrammes per centum of protein and an excess of globulin. The Wassermann test produced a "4+++" reaction, and the Lange gold curve was represented by the figures "5555543210". The diagnosis of general paralysis of the insane was established; the patient had grandiose delusions and was excited and confused. Treatment with Lugol's iodine in milk, and with "Bismecol" (two

millilitres every five days for 12 intramuscular injections), was commenced on January 18 and continued till March 18. On February 16 the administration of Romansky penicillin (one millilitre by intramuscular injection per day) was begun, the intention being to continue the treatment for fourteen days; it was discontinued after ten days because of the arrival of supplies of procaine penicillin. On March 9 the patient began a course of benign tertian malaria rigors; from March 9 to 31 he had 11 rises of temperature to 103° F. On March 26 a course of treatment with procaine penicillin was begun—two millilitres by intramuscular injection on Saturday, Monday and Wednesday for three weeks. From March 26 to April 13 the patient received nine injections

March 26, was begun on July 18 and continued to August 5. On August 15, examination of the patient's cerebro-spinal fluid gave the following figures. The fluid contained 150 erythrocytes and one lymphocyte per millilitre; the protein content was 30 milligrammes per centum, the Wassermann test produced a "++++" reaction, and the Lange gold curve was represented by the figures "555432100". These figures indicated a continued improvement in the cerebro-spinal fluid findings. The clinical improvement was very good.

This patient will require adequate follow-up investigation, with a further review in three months.

The clinical record of Patient B is as follows.

On January 5, 1949, investigation of Patient B gave the following findings. The cerebro-spinal fluid contained no cells and 40 milligrammes of protein per centum; the Wassermann test produced a "++++" reaction, and the Lange gold curve was represented by the figures "555555421". The blood also yielded a "++++" reaction to the Wassermann test. The diagnosis of general paralysis of the insane was established; the patient was confused, dull and apathetic. On January 17 a course of treatment with Lugol's iodine in milk, and with "Bismecol", was begun; this lasted until March 4. On February 16 Romansky penicillin treatment was begun, and this continued until March 4; one millilitre of solution containing 300,000 units was given per day, to a total of 5,100,000 units. (This was before procaine penicillin became available.) On March 11 a test dose of procaine penicillin was given, as for Patient A. On March 12 a course of benign tertian malarial rigors was begun and continued until March 31; the patient had 12 elevations of temperature to 103° F. On March 26 a course of nine injections of procaine penicillin was begun, as for Patient A; this lasted until April 13, when a total of 5,400,000 units had been given. The patient's clinical condition had greatly improved. Some choroiditis with transient blurring of the vision occurred early in the course of penicillin treatment, but this cleared without interruption of the treatment. On May 24 examination of the cerebro-spinal fluid gave the following information: no cells were present and the protein content was 35 milligrammes per centum; the Wassermann test produced a "++++" reaction, and the Lange gold curve was represented by the figures "5555432100". The patient at this stage was able to manage her household and children.

On May 31 a course of "Bismecol" injections was begun, two millilitres being given by intramuscular injection every fifth day to a total of 12 injections (July 25). On July 2 a test dose of procaine penicillin was given. From July 11 to 29 a course of procaine penicillin treatment was given, as for Patient A. Examination of the cerebro-spinal fluid on August 11 gave the following findings: the fluid contained no cells, and 20 milligrammes of protein per centum; the Wassermann test produced a "++++" reaction, and the Lange gold curve was represented by the figures "5555542100". The clinical result was excellent, and the patient had no visual defect.

TABLE I.

Time when Blood Specimen was Examined.	Units of Penicillin per Millilitre of Blood.	
	Patient A.	Patient B.
Before 1st injection, 28.3.49 ..	Nil	Nil
Before 2nd injection, 28.3.49 ..	0.25	0.25
Before 3rd injection, 30.3.49 ..	0.25	2.0
Before 4th injection, 2.4.49 ..	0.125	2.0
Before 5th injection, 4.4.49 ..	0.5	2.0
Before 6th injection, 6.4.49 ..	2.0	2.0
Before 7th injection, 9.4.49 ¹ ..	—	2.0
Before 8th injection, 11.4.49 ..	2.0	2.0
Before 9th injection, 13.4.49 ..	1.0	2.0
14.4.49 ..	2.0	2.0
15.4.49 ..	0.5	2.0
16.4.49 ..	2.0	0.25
17.4.49 ² ..	0.5	—
18.4.49 ..	2.0	2.0
19.4.49 ..	1.0	2.0
20.4.49 ..	2.0	0.25

¹ Patient A, spoiled specimen.

² Patient B, no specimen taken—week-end leave.

each of 600,000 units—a total of 5,400,000 units. Examination of the patient's cerebro-spinal fluid on April 21 showed that it contained 10 erythrocytes per millilitre, 50 milligrammes per centum of protein and no excess of globulin; the Wassermann test still produced a "++++" reaction, and the Lange gold curve was represented by the figures "5555432100". There was thus an improvement in the cerebro-spinal fluid findings at the end of the first course of treatment. Clinical improvement was apparent within one week of the commencement of penicillin injections.

On June 15 a course of "Bismecol" therapy, as before, was begun; this continued till August 9. On July 11 a test dose of procaine penicillin was given, two millilitres being administered by intramuscular injection. A second course of procaine penicillin treatment, similar to that beginning on

TABLE II.
Second Trial.

Patient.	Effect of Test Dose (2.0 Millilitres).		Routine Course.			
			During Course.		After Course	
	Time of Examination. (Intervals of Twenty-four Hours.)	Units of Penicillin per Millilitre of Blood.	Injection Before which Specimen was Taken.	Units of Penicillin per Millilitre of Blood.	Successive Examinations. (Intervals of Twenty-four Hours.) ¹	Units of Penicillin per Millilitre of Blood.
A. (Test dose 12.7.49.)	Before injection.	Nil	1st, 18.7.49	Nil	8.8.49	0.06
	13.7.49	0.06	2nd, 20.7.49	0.06	9.8.49	0.015
	14.7.49	0.03	3rd, 22.7.49	0.25	10.8.49 ¹	—
	15.7.49	0.015	4th, 25.7.49	0.5	11.8.49	Nil
	16.7.49 ¹	Nil	5th, 27.7.49	0.125	12.8.49	Nil
	17.7.49 ¹	Nil	6th, 29.7.49 ¹	0.25	13.8.49	Nil
	18.7.49	Nil	7th, 1.8.49	0.25	14.8.49	Nil
			8th, 3.8.49	0.25	15.8.49	Nil
			Special specimen ²	1.0	16.8.49	Nil
			9th, 5.8.49	0.12		
B. (Test dose 2.7.49.)	Before injection.	Nil	1st, 11.7.49	Nil	30.7.49 ¹	
	3.7.49	0.5	2nd, 13.7.49	0.125	31.7.49 ¹	
	4.7.49	0.06	3rd, 15.7.49	0.06	1.8.49 ¹	
	5.7.49	0.03	4th, 18.7.49	0.06	2.8.49	0.06
	6.7.49	0.015	5th, 20.7.49	0.25	3.8.49 ¹	
	7.7.49	0.015	6th, 22.7.49	0.25	4.8.49	
	8.7.49	Nil	7th, 25.7.49	0.125	5.8.49 ¹	0.06
			8th, 27.7.49	0.06	6.8.49	0.06
			9th, 29.7.49	0.06	7.8.49 ¹	0.06

¹ No specimen examined.

² Taken twenty-four hours after eighth dose.

¹ Patient A: beginning after an interval of three days.

² No further specimens examined.

This patient will require adequate follow-up investigation, with a further review in three months.

Summary.

1. A brief review of some of the recent literature upon which treatment has been based has been given.
2. A programme of investigation into the value of penicillin has been formulated, and some results in Stage II are given with the report of two cases.
3. The product used in these investigations has been tested and found adequate, as shown in Tables I to III.

Acknowledgements.

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Appendix. (H.F.)

Methods Used in Penicillin Estimations: Second Series.

The method used was Fleming's modification of the Wright slide cell technique, as described by Heilman and Herrel. Briefly, this method depends on estimating the concentration of penicillin in serum by titrating its bacteriostatic power on a standard strain of a hæmolytic streptococcus, *Streptococcus pyogenes* Rammelkamp, blood being used as an indicator of growth. When there is enough penicillin in the serum to inhibit the streptococci the blood is unchanged, but when the streptococci grow freely the blood is hæmolyzed; the end-point is the highest dilution of test material that completely prevents hæmolysis by the streptococci after twenty-four hours' incubation at 37° C. A control test, on a sample containing a known amount of standard calcium penicillin in sterile physiological saline, is performed with each set of tests.

As the specimens had been preserved in the frozen state until tested, for periods varying from a few days up to four weeks, it was decided to examine the keeping qualities of penicillin in human serum preserved under identical conditions. Two different dilutions, one containing one unit per millilitre, the other five units per millilitre of the standard calcium penicillin, were made in sterile pooled human serum. To avoid continuous freezing and thawing of the one sample, these dilutions were dispensed out in small quantities, and after preliminary titration the samples were frozen. Tests were performed at regular intervals and compared with a control containing one unit per millilitre of calcium penicillin made up in sterile physiological saline. No "binding" effect of the penicillin by the serum was observed, nor any deterioration of the samples over a period of four weeks.

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SOME EVERYDAY PROBLEMS IN DERMATOLOGICAL PRACTICE.¹

By W. C. T. UPTON,

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WHEN I accepted the invitation from your secretary to give a paper on some dermatological subject of especial interest to general practitioners, I must confess that my own problem was to decide what to talk about. I discussed the matter with a well known medical man, and he remarked: "Talk about some common skin diseases and don't be too technical."

If this lecture should appear too elementary I shall ask for your forbearance. I have now devoted nearly a quarter of a century to the study and practice of dermatology and have naturally had a long experience, both with my own problems and with those of many practitioners.

I shall not promise to solve these problems, but will indicate some means and methods that I have found useful in the management of some common skin diseases.

I want you to realize that I have made no attempt to deal with any one subject in detail. I have made practically no reference to general medical matters such as gross toxic foci, anæmia, constipation, *et cetera*. These conditions are just as important to attend to in skin complaints as in any other disease.

Psoriasis.

Let us commence with one of our greatest problems, psoriasis. Despite every investigation from almost any angle, we are still completely ignorant of the cause of this common disease.

You will have no trouble in diagnosing untreated psoriasis, except perhaps in the scalp. Patients are often referred with seborrhæic dermatitis which turns out to be psoriasis.

If you find hard scaly patches in the scalp that do not respond to the usual anti-seborrhæic applications, suspect psoriasis. Sometimes psoriasis commences in the scalp. Our problem now is to know what treatment to use. There is no certain cure, either internal or external.

What are we going to inform the patient? Shall we tell a "highly-strung" young woman that nothing can be done, or shall we encourage her? My practice is to give patients the following information: (i) The complaint is very common and the majority of patients are greatly helped if they cooperate. (ii) Sometimes the rash disappears for months or years without leaving a mark. (iii) As a rule there are no complications, and psoriasis is sometimes called a "disease of the healthy". (iv) The condition is not infectious.

Let us therefore in early cases of psoriasis be cheerful. We can deal with the complications and recurrences if and

¹ Read at a meeting of the South Australian Branch of the British Medical Association on October 27, 1949.

when they do take place. We can discuss the "ifs and buts" with a young patient's parents. In the case of a sensible adult we can be more candid.

Now for some actual treatment—and I shall deal with external treatment only.

Psoriasis of the Scalp.

Psoriasis of the scalp, I have found, often clears up more easily than psoriasis on other parts. Let the application be clean and easy to wash out and not leave any unpleasant odour. A useful prescription is the following: mercuric ammonium chloride and salicylic acid, of each 15 to 20 grains; greaseless base and cold cream, of each equal parts, to one ounce. This is rubbed in at night and washed out next day.

Psoriasis of Other Areas.

In psoriasis of other areas, always try clean treatment first, so as to avoid staining underclothes, sheets, pillows, *et cetera*. The following routine may be tried: (i) the taking of a hot, soapy bath; (ii) the rubbing in of the following ointment: *Liquor Picis Carbonis*, 60 minims; *Acidum Salicylicum*, 10 grains; *Hydrargyrum Ammoniatum*, 10 grains; greaseless base to one ounce. If this makes no impression, then "Cignolin" (0.5%) or a substitute should be added.

The patient should be instructed to report if the treatment causes much irritation, or better still should be inspected at regular intervals. X-ray treatment is clean and usually clears up patches when first used. It does not stop recurrences, and some patients become X-ray addicts.

If the lesions are very extensive, the patient should be in hospital. In certain cases, particularly in older people, it may be good treatment to leave the complaint alone if the patients are suffering no pronounced physical or cosmetic disability.

Acne Vulgaris.

One frequently sees a young woman with severe acne on the face causing her great distress on account of her personal appearance. Sometimes she has consulted a practitioner in earlier life who has told her perhaps: "That is only pimples due to your development, and you will grow out of it."

That may be good advice for mild acne, but he should have gone further and added: "If it gets worse, see me again."

In an average case of acne on the face, I have used for some years the following procedure modified after Molesworth. This procedure is carried out at night. (i) Remove the "make-up". (ii) Steam the face for five minutes. (iii) Pinch massage for five minutes, avoiding any painful area, especially on the upper lip. (iv) Wash the face with hot water and simple soap. (v) Dry the face. (vi) Dab on a lotion such as *Lotio Sulphurata*. (vii) Leave off treatment for a few days, especially the lotion, if the face becomes too sore.

For the severe form of acne I strongly advise X-ray treatment. It is not a certain cure, but it is the best local treatment of which I know. I believe in a definite course of treatment within safe limits, and not two or three small doses "just to encourage the patient".

For the average skin in these severe cases I have used for years the following factors and technique: 100 kilovolts, no filter, focal skin distance 25.5 centimetres, half-value layer 1.7 millimetres of aluminium, dose 150r; the treatment is applied every two weeks for six treatments.

When the course has been completed, after-treatment should be carried on, such as avoidance of certain foods, and the procedure as outlined for the treatment of mild acne should be observed.

You are all aware that certain foods and drugs, such as iodides and bromides, can stimulate the sebaceous glands and should be avoided. Certain glandular products are used, such as stilboestrol, but have been disappointing in my hands. I should be pleased to hear the opinion of some of my colleagues.

Contact Dermatitis.

Contact dermatitis may be divided into two groups for our discussion: (i) acute, in which the rash appears with dramatic suddenness; (ii) subacute, in which the rash slowly develops.

Contact dermatitis usually occurs on the exposed parts, as the face, hands and arms. Sometimes it occurs on the covered parts where the skin and clothes become saturated with dusts from chemicals or wood dusts or oils. Idiosyncrasy plays an enormous part.

The diagnosis of acute contact dermatitis on the face is usually easy because of the presence of redness, oedema, weeping and closure of the eyes.

Sometimes the cause is not always obvious. A practical point is to ask the patient what he was doing twenty-four hours before the rash appeared. Was there something new that had been applied to the face or scalp? I will give examples of recent patients: (i) a doctor who had been cutting a wormwood hedge; (ii) a girl who had applied for the first time a much-advertised hair "perm"; (iii) a matron of a hospital who had rubbed in a new cleansing cream, and left on a thick layer all night.

The treatment in such an acute case is often a problem. Almost anything seems to irritate some patients. I have found that cold compresses usually are the best application in the first place, such as lead and glycerin lotion, boric acid, bicarbonate of soda, normal saline, and a very useful application is equal parts of olive oil and lime water. Burow's solution, one part to 20 of water, is sometimes helpful.

Later, plain oily calamine lotion may be used, or some other bland application such as the following: distilled water five parts, Burow's solution five parts, anhydrous lanolin 20 parts, zinc paste 30 parts.

Plantar Warts.

Plantar warts, painful lesions on the soles of the feet, can be difficult to clear up. If you examine a plantar wart you will often find that the deeper surface is more extensive than the outer surface. This no doubt accounts for recurrences after excision, diathermy and sometimes X-ray treatment.

For a few well-defined warts, X-ray treatment is often successful; but the doses must be adequate, such as 2000r in divided doses, superficial X rays being used. If this amount does not effect a cure, the course should not be repeated.

For multiple warts, especially when the small "mosaic" type are present, X-ray treatment is out of the question.

Various chemical methods have been tried. I have had a fair amount of success with the following procedure in treating ordinary plantar warts: (i) Shave the wart and surrounding callus—this is usually painless. (ii) Apply a bunion or corn plaster or a piece of ordinary plaster with a hole in it, to the wart, which is thus exposed. (iii) Apply the following paste: salicylic acid 360 grains, trichloroacetic acid 60 grains, glycerin sufficient only to make a thick paste. (iv) Apply a piece of plaster over the area, and leave it on for four days. (v) Repeat the procedure twice—that is, twelve days' application in all. (vi) Examine the patient four days after the treatment has been finished. The wart frequently comes away on the plaster, or it may be gently assisted out. If the above-described method is not successful, the strength of trichloroacetic acid may be increased.

"Mosaic" warts may be treated by smearing on the paste for a few days and covering it with plaster. As a rule the paste is well tolerated.

The Problem of Industrial Dermatitis.

Industrial dermatitis is a big subject, and I shall touch only on certain aspects of it.

As soon as an employee develops a rash he should be instructed to report to the first-aid department or to a foreman, and should then be referred to the industrial doctor or to his own local medical attendant. If there is a suspicion that the rash is due to occupation, the medical practitioner should take careful notes on the following

points: (i) where the rash first began—it may have started on the legs as varicose dermatitis; (ii) where the rash is at the time of examination; (iii) the nature of the rash; (iv) the type of work in which the employee is engaged; (v) whether similar cases occurred with the same type of work; (vi) any treatments that had been used.

Industrial dermatitis usually commences on the exposed parts first—face, hands, wrists and forearms. However, in some cases dermatitis may originate on the covered parts, when the workman's clothes may become saturated with fine dusts, as chemicals, cement, lime, wood-dusts or oils. If the medical attendant is not sure of the diagnosis or the cause, he should refer the patient to the certifying surgeon or to a dermatologist for an opinion.

What often happens is this: the employee continues to work unless the rash is very severe, and several treatments may be tried without much improvement. Ultimately the workman is referred, either by the doctor or more often by an insurance company, to a dermatologist for a straightout opinion as to the actual cause. I can assure you that we dermatologists have sometimes a real problem. In some cases we cannot make a dogmatic statement one way or the other. Our problem would have been much easier if the patients had been examined earlier.

Some insurance companies now send their patients to a dermatologist as soon as they are aware that an employee has dermatitis or a rash. Sometimes they even ask for the treatment to be taken over. This presents no problem if the patient has no medical attendant. If he has, my own feeling is that the patient's doctor should continue to treat him, and perhaps ask for specialist's help if progress is not satisfactory.

It must be remembered that frequent mild attacks of dermatitis lower the skin's resistance, and that what may have been easy to cure in the early stages may develop into a real therapeutic problem. In fact, some patients ultimately develop a "compensation complex", and cure or a considerable improvement may not occur until the compensation claim has been finally settled.

I would make the following further points: (i) If occupational dermatitis is suspected, take the employee off that work at once. (ii) Treat the patient with bland treatment. (iii) If the condition has been very mild, or if there is some doubt about an occupational origin, the patient may return to work when he recovers, provided that (a) he uses protective creams on the exposed areas and suitable cleansing agents, and (b) he reports if a recurrence takes place. In the case of dermatitis of the covered parts, he should have facilities for a hot shower bath and have the baths at lunch and "knock-off" time. In all dirty jobs hot running water must be provided. If these measures are not successful, then a complete change of job is imperative. (iv) Employees with naturally sensitive skins should be regarded as "risks". (v) Some employees can be difficult. A few will not avail themselves of the facilities provided. Others feel that a change of job will mean a reduction in wages. Some of this latter group have said to me that they would rather continue to work "at their own risk". Experience has shown that if this type of workman should become sensitized he has a poor memory, and naturally seeks compensation benefits. These problems must be met with understanding, tact and firmness.

The Problem of Over-Treatment.

With regard to over-treatment, I shall confine my remarks to dermatitis. This is rather a delicate matter, but I feel it must be discussed. I am sure that my dermatological colleagues will agree with me that many patients with generalized dermatitis admitted to hospital or examined in consultation have suffered from over-treatment.

The following is a common history. A patient develops a simple rash, and he often rubs in some patent ointment or something recommended by the chemist to "kill the germ". Sometimes a patient is referred with the remark: "I prescribed a little acid salicylic and sulphur in an ointment, this appeared to help at first, but the rash is now getting out of hand."

We often come across cases in which penicillin cream, Whitfield's ointment, sulphanilamide ointment or powder, or some other chemical has been responsible for changing a simple rash into a long, tedious attack of generalized dermatitis.

If the dermatitis is acute, some suggestions about treatment have already been given in the section on contact dermatitis.

If the dermatitis is not acute, try bland preparations, in the first place, such as zinc paste, zinc cream, or some form of calamine lotion. Should the rash not respond to such simple measures, then it is time to try stronger applications, but not antiseptic ones.

A practical point and one worth remembering is this: try the application on a small area first, and extend it only if it suits. Such applications usually contain tar in some form or other.

Superficial X-ray treatment is often of great value, but I stress the point that it should be superficial. Filtration is not necessary, and the kilovoltage need not exceed 100.

The most important thing I have to say tonight is this: "Never use antiseptic treatment on simple dermatitis."

Some few years ago a lecture on skin diseases in the tropics in this theatre was given by an experienced army officer. He made this point: "The commonest causes of dermatitis were acriflavine and sulphanilamide." That lecturer is tonight our President.

PRIMARY MALIGNANT TUMOURS OF BONE.¹

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THE primary malignant tumours of bone have two outstanding characteristics. In the first place they are comparatively uncommon and in the second place they represent one of the most lethal forms of malignant disease. Their diagnosis rests on the evaluation of evidence obtained from a number of different sources—history, physical signs, and radiographic changes—a triad of evidence reinforced when required by the naked-eye and histological findings at a biopsy. The great majority of primary malignant bone tumours conform to pattern, and the various anatomical and clinical types become increasingly familiar to those who are continuously engaged in the study of this problem.

Classification of Tumours.

I believe that we must view with some misgivings the modern trend towards an increasingly elaborate subdivision of the primary malignant tumours of bone. This trend is the inevitable outcome of the foundation of the Bone Sarcoma Registry of the American College of Surgeons—that remarkable collective effort which has been one of the outstanding achievements in the realm of surgical pathology of our time. The first detailed but relatively simple classification adopted by the registry in 1928 was regarded in both the United States and Great Britain as adequate for the needs of the practising surgeon. In this classification, the primary categories of tumour were based on histogenesis, and the different types of tumour in each category were described in terms of pathological anatomy. Three years later there appeared the highly ingenious classification of Geschickter and Cope land (1930), in which tumours, both benign and malignant, were grouped on an embryological basis. This new classification was confusing rather than helpful to the clinician, and for this and other reasons it was not found generally acceptable. The latest classification adopted by the registry and expounded by that remarkable man James Ewing (1939) is on a more comprehensive scale.

¹ Read at the annual meeting of the Australian Orthopaedic Association, Perth, August, 1948.

Revised Classification of Bone Tumours (1939).

	Malignant.	Benign.
1. Osteogenic series: Osteogenic sarcoma	(i) Medullary and subperiosteal (ii) Telangiectatic (iii) Sclerosing (iv) Periosteal (v) Fibrosarcoma (a) Medullary (b) Periosteal (vi) Parosteal, capsular	(i) Exostosis (ii) Osteoma
2. Chondroma series	(i) Chondrosarcoma (ii) Myxosarcoma (i) Malignant	(i) Chondroma
3. Giant-cell tumour series	(i) Angioendothelioma (ii) Diffuse endothelioma	(i) Epiphyseal giant-cell tumour
4. Angioma series	(i) Plasma cell (ii) Myelocytoma (iii) Erythroblastoma	(i) Cavernous angioma (ii) Plexiform angioma
5. Myeloma series		
6. Reticulum-cell lymphosarcoma		
7. Liposarcoma		

The revised version is notable for the inclusion of the simple tumours in their appropriate histogenic categories, and for the abstraction of the malignant cartilaginous tumours from the osteogenic sarcoma group. The tumour which, as a clinical and histological entity, bears Ewing's name, is still regarded as an endothelioma, but has now been placed within a new primary group—the angiomata. Ewing himself regarded the histogenesis of this uncommon tumour as still *sub judice*, and commented on the fact that outside the United States of America the view was widely held that the tumour as a myeloma should be placed in the hæmatopoietic group.

During recent years preoccupation with the surgery of warfare has severely restricted the number of studies on bone tumours. But there are already signs that we may expect a further elaboration of existing classifications as the unique collection of tumours in the North American Registry is submitted to further scrutiny. The facilities offered by a large central registry of tumours for the review of selected groups of tumours analysed by competent observers, may be both a strength and a weakness, for there is the obvious temptation to the enthusiastic newcomer, who may have little previous knowledge of the subject, to explore the minutiae of histological patterns. I believe there is still a good deal to be said in favour of observations made on a substantial personal series of well-documented tumour cases in which the majority of the patients are remembered as individuals. This opportunity has of necessity been enjoyed by few surgeons. The importance of such personal contributions has been manifested in the past in the long series of authoritative articles with which both J. C. Bloodgood and W. B. Coley enriched our knowledge of the practical problems posed by the malignant tumours of bone. In more recent years valuable contributions of this type have also come from the Mayo Clinic in the writings of Meyerding (1936) and from Willis Campbell (1935).

It is obvious, of course, that for the purpose of a national or regional registry, or indeed for a large personal collection of tumours, a comprehensive classification is essential. But such a classification should present, in as simple a fashion as possible, the main distinctions founded on histogenesis, pathological anatomy and histological structure. Furthermore, any classification must be sufficiently plastic to allow readjustments within its broad outlines as ideas change from time to time. In the last analysis, all elaborate classifications represent a state of wisdom after the event. We should urge, therefore, that the wise teaching of the mediæval philosophers should not be

forgotten, and that entities should not be multiplied unnecessarily.

My own personal collection of primary malignant bone tumours now includes 187 fully documented cases (period 1920 to 1947), and for convenience in recording I have for some years used the following classification.

Primary Malignant Tumours.

1. Bone sarcoma	Osteogenic sarcoma	Sclerosing Osteolytic Chondromyxosarcoma
	Ewing's tumour	Paget's disease
	Extraperiosteal sarcoma	Osteodystrophia fibrosa
	Sarcoma in abnormal bones	Osteochondroma
2. Hæmatopoietic tumours in bone	Myeloma (single, multiple)	
	Reticulum-cell sarcoma	
	Hodgkin's disease, lymphosarcoma, myelocytic myeloma, chloroma	
3. Adamantinoma	Mandible	
	Other bones—for example, tibia	

This classification, like others, whether simpler or more elaborate, is essentially a provisional working scheme.

Diagnosis.

The surgeon, in his capacity either as a practising clinician or as a teacher of undergraduates and post-graduates, cannot approach a case of suspected bone tumour with an elaborate classification in his mind, even if he could remember its details for more than twenty-four hours. He must, of course, have such a classification available as a frame of reference which gives him an agreed nomenclature. But what he needs, and what he acquires only after long experience, is the ability to recognize certain broad groups of tumours based on what, for the want of a better term, may be called their behaviour pattern. This demands a clear understanding of the individual and collective significance of such factors as history, age period, sex incidence, and site of origin of the tumour—whether epiphyseal, metaphyseal or diaphyseal. In the approach to the problem of diagnosis I myself have found it useful to distinguish two main clinical or anatomical categories of tumours.

1. The first category is the extraosseous group, which embraces all clearly-defined encapsulated growths in which the main mass of the tumour lies superficial to the affected bone. These are tumours in the clinical sense of that term, as in the early stage they can be felt, and later both felt and seen. Into this category fall the simple osteo-cartilaginous tumours, and the various forms of bone sarcoma: (i) the osteogenic sarcoma and its subdivisions, the sclerosing, osteolytic and chondromyxosarcoma types; (ii) the Ewing tumour; and (iii) the extraperiosteal sarcoma. It should also be emphasized that to the practised fingers the contrast between an encapsulated tumour and an inflammatory swelling of bone and overlying soft tissues is often most striking and that this is true even of the Ewing tumour which, in certain stages of its life history, may mimic osteomyelitis.

2. The second category is the intraosseous or endosteal group, which includes all expansile lesions arising from within, and which from a radiographic standpoint fall into the category of neoplastic cysts of bone. In the very early stages, a localized eccentric or concentric expansion of the end or shaft of a long bone may be barely appreciable to the examining fingers; but the not uncommon occurrence of spontaneous fracture, and the evidence derived from radiographs, soon come to our aid. In the endosteal group of tumours the following are included: (i) the myxochondroma in its simple or malignant guise; (ii) the giant-cell tumour (simple or malignant); (iii) the whole range of hæmatopoietic tumours, in which from a practical standpoint the solitary myeloma (plasma

cytoma) is of special interest and importance; (iv) the rare adamantinoma of the long bones; and lastly (v) the relatively common solitary secondary malignant tumour in a patient in whom the primary cancer has so far not revealed itself. It is in the endosteal group of tumours perhaps that a biopsy gives us most valuable evidence, although it has its due place in the diagnosis of extraosseous tumours. I would emphasize that biopsy is neither a dangerous nor an imprecise procedure. One of the outstanding advantages of biopsy to the surgeon familiar with the living pathology of bone disease is the evidence afforded by the naked-eye appearance of the lesion, as well as the histological confirmation of the existence of a tumour and of its nature—evidence which comes from the expert pathologist.

You will notice that, in relation to the diagnosis of bone tumours, I use the term "evidence" throughout. I do so deliberately, for I hold that the evaluation of evidence derived from multiple sources, and the final decision regarding the fate of the patient, should be the ultimate responsibility of one man—the clinician. I see no logic in diagnosis by a committee. The opinion of experts must, of course, be given the fullest consideration; consultations may lead to the focusing of ideas; but the clinician, in relation to the diagnosis and treatment of bone tumours, does not merely represent one type of expert among many. He is the "synoptic man" who must see the problem and the patient as a whole. The place for a council of all talents is in the ultimate review of tumours for the purposes of classification, reclassification, and registration.

Prognosis.

In 1934 the American College of Surgeons Registry included 74 five-year survivals in 504 registered cases of osteogenic sarcoma, and 10 five-year survivals in 126 cases of Ewing's tumour. All these long-term survivors had been treated by surgical measures, in some cases combined with irradiation and Coley's toxins. In the same year W. B. and B. L. Coley (1934) reported a personal series of 261 tumours of the long bones, which included 35 five-year survivals in osteogenic sarcoma and 22 in Ewing's sarcoma. Of these survivors, 47 had received toxin treatment and some of them irradiation in addition, but all accessible tumours had been treated by operation. In another series analysed by W. B. Coley (1933), in 160 cases of osteogenic sarcoma of the long bones treated by irradiation, in which amputation had at first been refused by the patient, there were no five-year survivals unless the patient had subsequently consented to amputation. The conclusions to be drawn from these figures were that operation was the method of choice as soon as a diagnosis was established, and that in the considerable number of five-year cures then recorded in the United States, toxin treatment seemed to have played some part in the prolongation of life.

In 1939 the registry figures showed 101 five-year survivals in osteogenic sarcoma, and 14 in Ewing's tumour. Fifty of the patients with osteogenic sarcoma had been treated by surgical methods alone, and 50 by operation combined with irradiation, by Coley's toxin, or by a combination of these agents. Thirteen of the 14 patients with Ewing's tumour had also been treated by surgical methods. In the previous year (1938) Bradley Coley had analysed 359 cases of osteogenic sarcoma from the Memorial Hospital, New York, treated by amputation, with irradiation combined with Coley's toxin in almost half. In this series there were 10.5% of five-year survivals. In the same year (1938) Meyerding of the Mayo Clinic reported a 24% five-year survival rate in cases of osteogenic sarcoma following amputation, and a 9% five-year survival rate following irradiation alone. Simmons (1939), in a smaller series of 33 cases of osteogenic sarcoma, the majority of patients having been treated by operation, recorded 11 five-year survivals. Simmons concluded that pre-operative irradiation was a waste of time and that biopsy as a preliminary to amputation was both useful and safe. With both these conclusions I am in full agreement.

In one of the few papers of the war years, Macdonald and Budd (1943) analysed 118 five-year "cures" available

up to that time in the Sarcoma Registry; these consisted of 97 cases of osteogenic sarcoma proper and 21 cases of chondrosarcoma. This analysis suggested that the period of delay between the onset of symptoms and the initiation of treatment was greater for cured than for uncured patients. In this respect the authors, in common with B. L. Coley and Pool (1940), confirmed Ferguson's findings (1940), but they did not agree with Ferguson's hypothesis of a cycle of activity and regression in bone sarcoma as an explanation of this fact. Macdonald and Budd also found that a biopsy or an even more extensive preliminary surgical interference did not militate against long survival, and that there was no statistical evidence for or against the value of irradiation as an ancillary curative agent.

In my own collection of 183 bone sarcomata of various types, of 114 patients with accessible tumours treated by radical operative means, 84 survived over two years. Of these the most recent survey (1948) reveals the existence of 26 five-year survivors—19 patients with osteogenic sarcoma and seven with extraperiosteal sarcoma. There were no long-term survivors in the small group of Ewing's tumours. Of the 26 five-year survivors, 22 were treated by amputation or disarticulation (two by hindquarter amputations), two by excision (in one of them followed by a disarticulation at a later stage), and one by irradiation alone (a sarcoma of the femur and pelvis, but lacking histological proof). Coley's toxins were used in a small number of cases, but for various reasons it was impossible to apply this form of therapy systematically.

I would emphasize the fact that many large primary malignant tumours of the pelvis are for a time operable by the method of hindquarter amputation. In Great Britain the outstanding contribution on this subject has been made by my colleague Sir Gordon Gordon-Taylor, whose personal experience of this heroic operation is unique (Gordon-Taylor, 1940; Gordon-Taylor and Patey, 1946; Gordon-Taylor and Wiles, 1935). I have carried out this procedure in six cases, with one post-operative death eleven days later.

Although the prognosis in osteogenic sarcoma is not as tragic as we believed it to be at one time, we are still unable to regard any single factor or group of factors as significant in relation to survival periods. We can say that of the various histological types of tumour the spindle-cell sarcoma appears to be the least malignant form. Both the chondrosarcoma and the extraperiosteal sarcoma groups contain tumours of varying degrees of malignancy; some of the former are exceedingly benign and a proportion of long survivals can be expected. Of the 34 cases of extraperiosteal sarcoma in my own collection, six appear among the five-year survivals and eight are in the list of short survivals (under two years; 1948 review). The outlook in Ewing's tumour is always grave, but the reticulum-cell sarcoma differentiated from the Ewing group has been found to show a better prognosis (Parker and Jackson, 1939). Hamatopoietic tumours in general are most lethal, but a solitary myeloma (plasmacytoma) in a long bone may grow slowly for a long period and offer the opportunity of temporary cure by resection or amputation.

We can, however, be more dogmatic concerning the value of what some illogically regard as rival methods of treatment in primary malignant tumours of bone. In my judgement the case for the surgical eradication of accessible tumours as the treatment of choice is fully proven. Irradiation and such systemic agents as Coley's toxins cannot supplant operation. They are ancillary methods of therapy which may have some value in the pre-operative and post-operative stages, but even this claim is so far unsupported by convincing statistics.

It is perhaps a depressing thought that the mutilating operation of amputation still remains our chief contribution to the temporary or lasting cure of the primary malignant tumours of bone. Owing to the anatomical site of the majority of the tumours, local resection is not often a feasible undertaking; but when the opportunity arises the possibility of using this more conservative procedure should not be overlooked.

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Reports of Cases.

GENERAL PARALYSIS OF THE INSANE TREATED WITH PROCAINE PENCILLIN.

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In view of the advantages of procaine penicillin over the aqueous preparation, it was resolved to test one of the available preparations to determine its efficacy in maintaining therapeutic levels of penicillin in the blood. A sample of procaine penicillin G in oil and 2% aluminium monostearate solution was used.

TABLE I.

Day after Injection.	Blood Penicillin Level. (Units per Millilitre.)
First	0.06
Second	0.12
Third	0.12
Fourth	4.0
Fifth	0.06
Sixth	0.015
Seventh	Nil

Clinical Record.

The patient, a female, aged fifty-two years, was admitted to hospital in an excited, confused and restless state. The blood gave a "++" reaction to the Wassermann test. The cerebro-spinal fluid was at a pressure of 120 millimetres of water, and gave a "++++" reaction to the Wassermann test; the protein content was 70 milligrammes per centum, and the Lange gold curve was represented by the figures "5555445210".

After six injections of "Bismecol" to reduce the possibility of a Herxheimer reaction, a test dose of 600,000 units of procaine penicillin was injected intramuscularly, and blood samples were examined daily for seven days to observe the absorption and maintenance of the penicillin in the blood plasma. The result of this experiment was as shown in Table I.

At the end of this test a course of procaine penicillin, 600,000 units three times a week, was begun; this continued for three weeks, a total of 5,400,000 units being given. A blood sample for a penicillin assay was withdrawn prior to each injection. The results of these examinations are shown in Table II.

TABLE II.

Date.	Blood Penicillin Level. (Units per Millilitre.)
8.7.49	Nil
11.7.49	0.03
13.7.49	0.5
15.7.49	2.0
18.7.49	1.0
20.7.49	0.12
22.7.49	0.25
25.7.49	0.12
28.7.49	1.0

At the conclusion of this course a further three specimens of blood were taken during the following week. The residual concentrations were as shown in Table III.

TABLE III.

Days after Conclusion of Penicillin Treatment.	Blood Penicillin Level. (Units per Millilitre.)
Two	0.12
Four	0.06
Six	0.03

Six more injections of two millilitres of "Bismecol" were given during the administration of the procaine penicillin. At the end of the course the patient's condition was remarkably improved. The excitement and confusion had disappeared and except for lack of insight into her illness, poor retentive memory and shallowness of affect, she showed no signs of her original profound mental disturbance. Examination of the cerebro-spinal fluid now gave the following findings: the Wassermann test produced a "++++" reaction; the fluid contained 40 milligrammes of protein per centum; the Lange gold curve was represented by the figures "5555432100". The cerebro-spinal fluid findings fail to indicate the dramatic clinical improvement in the patient, the findings remaining essentially the same as previously, except for the return of the protein content to within normal limits. So far the patient has remained well. She will, of course, be subjected to the usual follow-up investigation.

Comment.

This case demonstrates that procaine penicillin injected three times a week maintains an adequate therapeutic blood level of penicillin. It is painless when injected, and the advantage to the patient and to the hospital staff is considerable.

Acknowledgements.

I am indebted to F. H. Faulding, Proprietary, Limited, for supplying the procaine penicillin, and to Miss Nancy Atkinson, of the Institute of Medical and Veterinary Science, for arranging for the assays to be carried out. I wish to thank the Superintendent of Mental Institutions, South Australia, for permission to report this case.

VAGINAL ATRESIA WITH CRYPTOMENORRHEA.

By PHILIP C. THOMAS, M.R.C.O.G.,
Perth.

CRYPTOMENORRHEA is not true amenorrhœa, since the utero-ovarian cycle is intact; but, owing to some mechanical factor producing a total obstruction at various levels in the vagina or at the cervix, there is no external menstrual discharge. The atresia may be congenital or it may be acquired as a result of trauma, inflammatory conditions, operations (judicious or otherwise), irradiation and neoplasms. The damming back of the menstrual discharge leads to a progressive accumulation of this material in the vagina (hæmatocolpos), the uterus (hæmatometra), and the Fallopian tubes (hæmatosalpinx), depending on the level and duration of the obstruction. This is manifested clinically by a period of amenorrhœa associated with recurring attacks of lower abdominal or perineal pain and backache, and a fluctuating pelvic mass demonstrable by rectal or abdominal examination.



FIGURE I.

It is postulated that there was first congenital stenosis of the vagina at AA.

It is postulated that, in the following case, the obstructive amenorrhœa was due to congenital stenosis of the middle third of the vagina, which became converted into complete atresia by superadded inflammation or organization of blood clot (Figures I, II and III). It is said that hæmatometra and hæmatosalpinx are exceptional complications of imperforate hymen, but are much more frequently encountered, as in this case, with vaginal atresia.

In view of the comparative rarity of the condition it is thought that an account of such a case may be of interest.

Clinical Record.

N.C. was an alert, intelligent young girl, aged fourteen years and nine months. Her past medical history included chickenpox and measles, but she stoutly denied any association whatever with the opposite sex or interference of any kind with her external genitalia. She stated that at no time was there any vaginal discharge.

She was well until May, 1948, when she commenced complaining of almost daily attacks of abdominal pain, not constant in position and unassociated with any rise in temperature, nausea or vomiting. After three months of this the family doctor removed the appendix (July, 1948).

This was done through a right lower paramedian incision; the pelvic organs were apparently normal at that time, and therefore it is doubtful whether the foregoing symptoms had any bearing at all on subsequent events.

In August, 1948, she had her first menstrual period. It lasted for two weeks and was heavy enough to warrant the use of five or six diapers daily, and the hypogastric pain that preceded it by a few days was relieved by the onset of the flow. After this there were no further menstrual periods.

Three months later (November, 1948) she commenced to complain of pain, mostly hypogastric and "in the back passage", and associated with headache. These symptoms were relieved by rest in bed, but would recommence when she was up and about, and "seemed to be worse" about the time that a menstrual period should have come on.

Early in March, 1949—that is to say, after about five months of intermittent lower abdominal pain and seven months of amenorrhœa—the patient became aware of a



FIGURE II.

The stenosis at AA becomes converted into atresia by inflammation or organized blood clot. This obstruction leads to the formation of hæmatocolpos, hæmatometra and hæmatosalpinx.

hypogastric swelling and noticed that it grew bigger during the next two months. The increase in size was spasmodic and was usually synchronous with the attenuated pain of the missed menstrual period, and, although it was followed immediately by a slight remission of pain and retrogression in size, the general *crescendo* of these two features was maintained during the months of March, April and May. The bowels were sluggish, but apart from some loss of weight there was no evidence of any constitutional disturbance.

On May 24, 1949, the patient presented herself at the Royal Perth Hospital as a healthy-looking, slim young girl, showing normal complete development of the secondary sexual characteristics. Rising out of the pelvis to umbilical level was a tense, cystic, non-tender mass, the lower pole of which completely filled what was at first thought to be the anterior vaginal fornix, with some bilateral spread, and at the same time pressed posteriorly upon the rectum (Figures II and III). The swelling was dull to percussion and had some lateral mobility. On tactile examination *per vaginam* there was no sign of any hymenal membrane, and obstruction by the tumour mass was encountered about one and a half inches from the introitus. *Per rectum* the mass could be felt

through the anterior wall, but the upper limit could not be reached. The pelvic mass appeared to be continuous with the abdominal tumour, and it was considered with some confidence that the condition present was probably some form of cryptomenorrhoea.

On May 28, under anaesthesia, it was found that complete vaginal atresia was present about one and a half inches from the introitus. The vault was incised, and by burrowing digitally dorsocranially for an inch or so in the tissue plane between the bladder and rectum the tense cystic mass was encountered. Laparotomy was then performed to confirm the diagnosis and to check the extent of the condition. It was then found that a much distended vaginal vault passed almost imperceptibly into an almost equally distended cervix and uterus, the last-mentioned being about the size of a 4½-months gravid organ and elevated to an entirely abdominal position. The ampullary ends of the Fallopian tubes were only mildly distended with blood and the ostia were sealed. The right ovary was slightly enlarged and mobile, but the left ovary, although

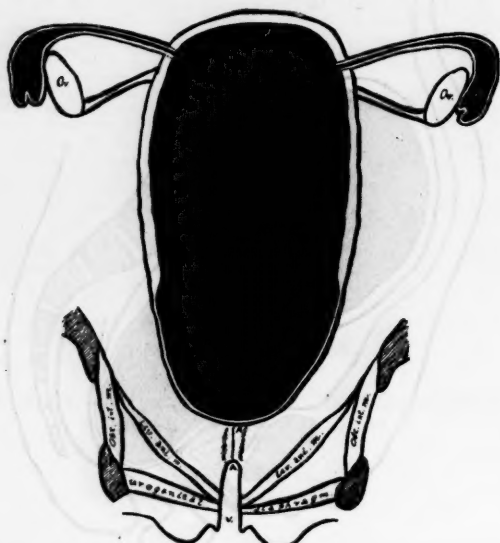


FIGURE III.

normal in size, was densely bound down with its Fallopian tube by adhesions to the posterior leaf of the broad ligament. There were also light filmy adhesions between the sigmoid colon and the left infundibulo-pelvic ligament. It was thus confirmed that the vaginal atresia had resulted in a hæmatocolpos, hæmatometra and hæmatosalpinx.

A pair of Howard Kelly forceps was then thrust into the hæmatocolpos from below and about ten ounces of thick, chocolate-coloured, inspissated blood oozed like brown mud from the vaginal orifice. The opening was dilated to admit two fingers, and two half-inch stout-walled rubber drain tubes were inserted from below, through and beyond the atresic area, after which the abdomen was closed.

The administration of full doses of penicillin and sulphadiazine was commenced immediately. The temperature rose to 101.4° F. the following day, but gradually subsided to normal by the ninth day and remained so. On the fourth day (June 1) about three ounces of bright blood were lost *per vaginam* (possibly a menstrual period); but from the seventh day there was no further discharge and the patient left hospital on the tenth day, free of any pain and maintaining that she had "never felt better".

Discussion.

The interesting and important features of this case are, firstly the aetiology, secondly the policy adopted at operation, and lastly the further management of this patient.

Discharge of menstrual blood into the abdominal cavity can give rise to all the signs and symptoms of a chemical type of peritonitis and may eventually result in the production of endometriosis. The abdominal adhesions noted at the operation may have been caused in this way; but if so they would be a late end-result of the atresia and not an initial event. For this reason it is thought that the abdominal symptoms preceding the appendicectomy in July, 1949, can probably be regarded as incidental. The fact that the patient had had three weeks of free vaginal hemorrhage nine months before the operation for the relief of the obstruction rules out congenital atresia, of a complete degree at any rate, whilst on the other hand the pelvic adhesions observed at laparotomy lend support to the theory that initially congenital stenosis of the vagina may have been present, which became completely obstructed by superadded inflammation. However, as was mentioned above, it is also possible that the same effect could have resulted from the organization of menstrual blood in the stenosed area, and in the absence of a history of vaginitis this is a pertinent point. The complete absence of the hymen strongly suggests that maldevelopment was a factor.

With regard to the treatment of this condition, anyone who has reviewed the literature will be impressed, if not by the absence of any leads, at least by the vagueness thereof and by their lack of specificity. In any case, as in most other spheres, the advent of the sulphonamide drugs, penicillin *et cetera* has revolutionized the outlook in these cases as regards infection. The various procedures recommended vary from opening of the sealed tubal ostia to salpingectomy and hysterectomy. In this case the first was rejected for fear of infecting the pelvic peritoneum and the two last-mentioned on account of the patient's extreme youth. The Fallopian tubes and uterus may be completely useless to her and their removal may be required later; but it was held that a girl of fourteen years must be given her chance, slender though it probably is, to retain organs which may function normally, and for this reason nothing was done apart from relieving the obstruction. The further management of this case would appear to consist of maintaining the patency of the vaginal canal, counteracting any tendency to stenosis from scar formation, later on checking the condition of the genital tract by hystero-graphy, and last but not least, attending to any psychological treatment as the occasion demands.

SEVERE NUTRITIONAL DISTURBANCE FOLLOWING VOMITING IN PREGNANCY WITH WERNICKE'S SYNDROME.

By R. JEREMY,

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Clinical Record.

Mrs. McG., aged twenty years, was admitted to Saint Vincent's Hospital, Sydney on March 11, 1949. She was pregnant, her last menstrual period having occurred late in October, 1948. She had been confined of a child previously, fourteen months before, and towards the end of that first pregnancy she was said to have "taken kidney fits".

Since the latter part of December, 1948, she had suffered from "morning sickness", which had increased in severity. Her condition did not improve with treatment, and she was admitted to hospital on February 21, 1949. In spite of further measures, which included isolation, sedation with phenobarbital, and the intravenous administration of 5% glucose solution in saline, she continued to vomit all solid food and fluids. On March 6 she complained of faulty vision and two days later of double vision, and said that she could see only large objects. Her blood pressure was then 120 millimetres of mercury, systolic, and 86 millimetres of mercury, diastolic. Her urine contained a trace of sugar but no albumin. On the next day, March 9, she "appeared to be seeing things, acted peculiarly with her visitors and rambled in her conversation". During the

day left lateral rectus palsy and later bilateral rectus palsy were observed. The urine still contained a trace of sugar. It was noted that the knee and ankle jerks were sluggish and that the left plantar response was extensor in type. She continued to be noticeably listless and apathetic. For a week there had been a persistent increase in the pulse and respiration rates.

On her admission to Saint Vincent's Hospital on March 11, her state of general nutrition was good; she appeared to be overweight. Clouding of consciousness was present, but by painful stimuli she could occasionally be aroused to answer questions. The visual acuity appeared to be diminished—it seemed that she could distinguish only light and shade. Both pupils were dilated and did not react to light. Bilateral sixth nerve palsy was present, with nystagmus on attempting to look to the right and left. The ocular fundi were abnormal; the retinal veins were engorged and the optic disks were swollen with irregular white areas of indefinite outline around their margins. Near the disks especially, but also further out in the retina, were fresh retinal hemorrhages. The retinal appearance bore a close resemblance to the illustrations published by Stander (1932) in reporting on a patient with a similar condition. The limbs could be moved voluntarily and their muscular tone and coordination seemed normal. The muscle jerks were present and equal in response in the upper limbs, but the knee and ankle jerks were absent on both sides. The abdominal reflexes were absent. On the left side the plantar response was extensor in type, on the right side equivocal. A widespread cyanotic mottling of the skin was present, in the distribution of the sub-papillary plexus. The pulse rate was regular at 96 per minute, the temperature was 98.4° F., and the respirations numbered 22 per minute, but were irregular. The blood pressure was 116 millimetres of mercury, systolic, and 86 millimetres of mercury, diastolic. The heart did not appear to be enlarged and the heart sounds were normal. The urine contained a moderate cloud of albumin, and the urinary sediment numerous hyaline and granular casts. Benedict's test gave a strongly positive result for sugar; the blood sugar content was estimated at 245 milligrammes in 100 millilitres of blood and the blood urea content at 54 milligrammes in 100 millilitres of blood. The urine gave a strongly positive reaction to the test for acetone. The Wassermann and Kline tests failed to produce reactions with the blood. Lumbar puncture showed the cerebro-spinal fluid pressure to be low, and the specimen was obtained by suction. The total protein value of the cerebro-spinal fluid was estimated at 200 milligrammes in 100 millilitres. (This estimate was unreliable and probably much too high, owing to a technical error occurring in the hospital at that time.) No cells were seen in the fluid. A blood count showed the red cells to number 5,450,000 per cubic millimetre, the haemoglobin value being 16.3 grammes in 100 millilitres. The number of white cells was estimated at 8000 per cubic millimetre, the distribution of cells being normal.

As the clinical picture resembled that described as Wernicke's encephalopathy, the patient was given 100 milligrammes of thiamine chloride intravenously at 6.35 p.m. on the day of her admission to hospital; she was also given 15 units of soluble insulin subcutaneously. During the forenoon of the next day her condition had already improved. She was conscious and cooperative and answered questions readily; she said that she felt "funny in the head". She was able to see and count fingers before her eyes. The pupils were still dilated, but reacted freely to light. The urine was free of albumin, sugar and acetone, and the cyanotic mottling of the skin had disappeared. She had not vomited since her admission to hospital, so she was given a soft diet of high caloric and high vitamin value; she took small quantities of this from the first, and throughout her stay in hospital gradually increasing amounts were taken. From the second day in hospital she was given each day 100 milligrammes of thiamine chloride intramuscularly, 100 milligrammes of nicotinic acid and 100 milligrammes of ascorbic acid orally, and five millilitres of "Campolon". This medication was continued until distinct improvement was shown.

The bilateral rectus palsy did not disappear until the seventh day after treatment was begun. Nystagmus persisted until the twentieth day. No fresh retinal hemorrhages appeared, and those present were gradually absorbed; on the thirteenth day the optic disk margins were free of swelling. The plantar responses became normal by the twentieth day. Regular tachycardia, the pulse rate sometimes reaching 140 per minute, was persistent. Electrocardiographic examination revealed sinus tachycardia with low voltage; the pulse rate gradually slowed and by the fortieth day was 80 per minute. The knee and ankle jerks were still absent when the patient was discharged from hospital on the sixty-first day. While tenderness of the calves had been noted in the earlier stages of the illness, no gross sensory abnormalities had ever been found. The patient's gait was somewhat unsteady when she left the hospital, but objective tests for ataxia gave negative findings.

On the day of the patient's admission to hospital the uterus could be felt above the pubis, almost reaching to the umbilicus. An Aschheim-Zondek test produced a positive result on the eighteenth day. Miscarriage of a macerated foetus, which had probably been dead for some weeks according to the opinion of the gynaecologist, occurred on the forty-ninth day. The date of the death of the foetus is thus uncertain.

Discussion.

This patient's illness is reported as an example of severe nutritional disturbance following severe vomiting in pregnancy. That the nutritional deficiencies were multiple is probable from the history of prolonged vomiting and scanty food intake. However, the rapid response to thiamine chloride was notable. Within twenty-four hours the state of consciousness had improved; the pupillary reaction to light had returned; the shock-like state, with sluggish peripheral circulation, was relieved, and the glycosuria had disappeared. It is unlikely that the administration of 15 units of soluble insulin was responsible for all these effects, if it was responsible for any. No other medication, parenteral or oral, had been given by the time that distinct improvement had occurred. Jolliffe *et alii* (1941), in reporting 27 cases of the Wernicke syndrome, noted prompt response of the ophthalmoplegia to the use of thiamine chloride, and concluded that the syndrome resulted from a combination of severe nutritional deficiencies affecting the nervous system, but that the ophthalmoplegia was due to a thiamine deficiency. Burgess (1946), who had treated prisoners of war, reported that treatment and prophylaxis with vitamin B₁ of the superior hemorrhagic encephalopathy of Wernicke were eminently satisfactory. Sheehan (1939) described the syndrome as occurring with hyperemesis gravidarum and reported characteristic autopsy findings. Ecker and Woltman (1939) reported a case with autopsy findings; they mentioned two patients with ocular and mental symptoms who had been treated by thiamine chloride given intramuscularly with astonishing improvement in the mental status within twenty-four hours and subsidence of the other neurological symptoms within two or three more days. They suggested that the essential cause of the lesions might be nutritional deficiency especially of vitamin B₁, and they had observed several such cases in pernicious vomiting of pregnancy and in vomiting following abdominal and pelvic surgical procedures. Large doses of vitamin B₁ given parenterally immediately after the onset of the syndrome resulted in rapid recovery.

Summary.

The illness of a patient suffering from severe nutritional disturbance following vomiting in pregnancy is described. The Wernicke syndrome was considered to be present, with clouding of consciousness, internal and external ophthalmoplegia and papilloedema with retinal hemorrhages. Glycosuria was present with hyperglycemia, tachycardia, peripheral neuropathy and abnormal plantar reflexes. After the intravenous use of thiamine chloride, rapid improvement of the state of consciousness and relief of the internal ophthalmoplegia occurred and glycosuria

ceased. The external ophthalmoplegia, nystagmus, abnormal plantar reflexes, tachycardia and peripheral neuropathy were slower to respond.

Spontaneous abortion occurred.

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Reviews.

MODERN DISCOVERIES IN MEDICAL PSYCHOLOGY.

THE previous edition of Clifford Allen's "Modern Discoveries in Medical Psychology" appeared in 1937.¹ His revised work is lighter to hold, the type is smaller but still easy to read, and the pages number 236 as against the 280 of the first edition, in spite of the addition of a chapter and index.

The chapters on Freud, Jung, Adler *et cetera* are unchanged. Is there nothing new to report in "Further Discoveries of the Psycho-analysts" since 1937? We are also given to understand that the cost of maintaining mental hospitals in England has not risen during the past twelve years. The additional chapter on "Wagner-Jauregg and His Followers" contains a general description of physical methods of treatment such as malarial therapy (penicillin is not mentioned), convulsion and insulin shock therapy, and leucotomy. This chapter seems a little out of place in a work on medical psychology.

The reader will obtain a superficial orientation of fairly recent thought on medical psychology, but the work will appeal more to the general reader and to psychologists who are not in close touch with clinical psychiatry than to the general or specialist medical practitioner. However, it has been translated, so the cover informs us, "into such diverse languages as Bengali and Italian".

PSYCHO-ANALYSIS.

In "Psycho-Analysis" Edward Glover gives a characteristically clear account especially directed to any who desire to gain a practical knowledge of the subject.² It is the second edition and was published in 1949.

Glover stresses the fact that psycho-analysis is essentially aetiological treatment because it aims at revealing emotional causes of which the sufferer is unaware, whereas the effect of other forms of psychotherapy is minimization of symptoms through suggestion. Among the latter he includes "hypno-analysis" and "group-analysis", which he describes as improved varieties of suggestion rather than psycho-analysis. Because, however, psycho-analysts are few and emotional illnesses many, he recognizes the need for suggestion therapy when psycho-analysis is impracticable. On the other hand, he realizes its sterility as an instrument of research in comparison with psycho-analysis.

In the past it has been customary for sufferers from emotional illnesses of all kinds to be referred to psycho-analysts for decision as to what treatment would be practicable in any particular case. Glover explains in detail the types which would benefit most from psycho-analysis and those which would be least suitable, so that medical prac-

tioners may decide for themselves when to recommend it. Incidentally, he regards psychosomatic illnesses as requiring a physiological approach in addition to a psychological one.

Glover stresses the importance of theory as an ideational tool; but, despite his scientific orientation, shows bias against a viewpoint which, if correct, is likely to prove of great value in the treatment of psychotic patients. This is the theoretical system enunciated by Melanie Klein to account for observations made while psycho-analysing children. Though Glover discusses Klein's opinions at length, he does not mention her name.

Some of Glover's arguments are open to question, but his discussion should help to clarify the present situation, which, like other scientific controversies, may herald a big advance in the field of psycho-analysis. In fact Glover has already produced a modification of Klein's viewpoint which appears important.

Included in the book is a glossary of nearly one hundred psycho-analytical terms, a very complete index, and a useful but too selective "List of Books Recommended".

THE VITAMINS IN MEDICAL PRACTICE.

ENGLISH MEDICINE has produced many excellent monographs of medium size, and another such is "The Vitamins in Medical Practice", by J. Shafar.³ The author has tackled this difficult subject with great skill and has managed to put a tremendous amount of information into a relatively small space. The field is covered very thoroughly.

The arrangement of the subject matter is unusual and merits some attention. Essentially the book consists of three parts: the first a description of the individual vitamins, the second devoted to the common deficiency syndromes, and the third dealing with the subject on a regional basis, for example, "Vitamins and Oral Structures", "Vitamins in Disease of the Gastro-Intestinal Tract" and so on. This may be slightly inconvenient for a student who wishes to study an individual vitamin, but should prove useful to the clinician and convenient for reference. It also serves to emphasize the close interrelation of certain vitamins. Clinical descriptions are excellent, and the main emphasis is on the practical uses in medicine. Nevertheless, the chapters devoted to the properties of individual vitamins are comprehensive and a model of methodical and succinct writing. The principles, but not the details, of methods of estimating the vitamins, and laboratory methods of detecting deficiencies, are discussed and evaluated.

The style of writing is easy and readable, references to original work are profuse and the index is good. An addendum brings the subject up to date. If there is any criticism, it is that the author gives us too little of his own views; but although this subject, in which knowledge is advancing so rapidly, calls for the mention of much work which may prove of little value, the emphasis is well placed and conservative.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Analyses médicales de pratique courante. Prélèvements—Chiffres normaux. Variations pathologiques", by P. Fonty; 1949. Angers: Éditions de l'ouest. 9" x 5½", pp. 132.

Intended as a guide for the practising doctor (as well as the student) in the field of present-day biology.

"How Your Body Works", by Geoffrey H. Bourne; 1949. London: Sigma Books, Limited. Sydney: Walter Standish and Sons. 8½" x 5½", pp. 248, with 91 illustrations. Price: 12s. 6d.

Physiology for the lay reader.

"A Doctor Regrets", by Donald McL. Johnson; 1949. London: Christopher Johnson. 8½" x 5½", pp. 248, with many illustrations. Price: 12s. 6d.

The first volume of the autobiography of a doctor who became a publisher.

"The Vitamins in Medical Practice", by J. Shafar, M.D., M.R.C.P., D.P.H.; 1949. London: Staples Press, Limited. New York: Staples Press, Incorporated. 8½" x 5½", pp. 386. Price:

¹ "Modern Discoveries in Medical Psychology", by Clifford Allen, M.D., M.R.C.P., D.P.M.; Second Edition; 1949. London: Macmillan and Company, Limited. 8½" x 5½", pp. 246. Price: 12s. 6d.

² "Psycho-Analysis: A Handbook for Medical Practitioners and Students of Comparative Psychology", by Edward Glover, M.D.; Second Edition; 1949. London: Staples Press, Limited. New York: Staples Press, Incorporated. 8½" x 5½", pp. 370. Price: 15s.

The Medical Journal of Australia

SATURDAY, MARCH 4, 1950.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE FEDERAL COUNCIL AND MEDICAL EDUCATION.

In January, 1948, in the course of an article entitled: "The Federal Council: A Plea for Action", it was suggested in these columns that the subject of medical education should be examined in Australia from the Australian point of view. Reference was made to several investigations carried out in Great Britain and in America. It was stated that Australia would have to inquire into medical education and similar matters before very long, and the Federal Council of the British Medical Association in Australia was named as an appropriate body to initiate the inquiries. One reason for the making of this suggestion was that the British Medical Association is concerned with the whole of medicine and that science takes pride of place over politics in the objects of the Association. The Federal Council is necessarily concerned with medical planning and with other aspects of what is known as medical politics; its major scientific activity is the Australasian Medical Congress of which sessions are held at times determined by the Council. There is no doubt that it would be for the good of the Federal Council, for its *amour propre*, to initiate non-political movements and inquiries, and it would also enhance the standing of the Council in the eyes of thoughtful non-medical members of the community if this was done. No one can deny that it would be an advantage if the public at large could be given a correct, a balanced, idea of the intentions and ideals of the Association. The Federal Council can command the best brains in Australian medicine and no ulterior motive could be attributed to it if it tried to set going an inquiry on the application of the most recent views on medical education to Australian conditions.

The leading article of January 10, 1948, was referred to the Federal Council at its meeting in March, 1948, and in the report of the meeting published in our issue of May 1, 1948, we read that most of the Branches had considered the article and agreed that something should be done. One or two members spoke in favour of the proposal, but a third said that the proposal was too vague. The General Secretary reminded the Council that the Parent Body was at that time preparing a comprehensive

report on medical education, which would shortly be published. The Council took the easy path and resolved to defer consideration until the report of the Parent Body had been received. This report was received soon afterwards. It was discussed at considerable length in the issue of June 19, 1948. When the Federal Council met in August, 1948, the publication of the report was noted and no mention of the "deferred consideration" was made. (See THE MEDICAL JOURNAL OF AUSTRALIA, September 18, 1948, page 329.) But fortunately the Council is not to enjoy for long the respite of its own devising. Dr. Kempson Maddox chose as the subject for his President's address to the New South Wales Branch at the annual meeting last March "The Training of a Doctor". (See THE MEDICAL JOURNAL OF AUSTRALIA, May 21, 1949, page 669.) He referred to the report of the Parent Body on medical education and discussed many of the aspects of the subject in a lucid and comprehensive way. In one of his conclusions he suggested that the Federal Council should form its own medical curriculum committee with the report of the Parent Body as its text-book. This was considered by the Council of the New South Wales Branch and sent on to the Federal Council for consideration at its meeting of January, 1950, with the recommendation that the Council should establish "a Standing Committee on Medical Education, similar to that of the Parent Body, whose function would be to formulate standards of pre-medical and medical education in Australia, and to keep the Federal Council informed on such matters". The Federal Council again made no decision, but referred the matter to the Branches. No one recalled the similar proposal referred to the Branches nearly two years before.

It may be held that, because the four medical schools of the Australian Commonwealth produce medical graduates of high intellectual quality and attainment, there is no need for inquiry or for the acceptance of a watching brief by any Australian body. The arguments against such a view need not be traversed once more. To show, however, that persons qualified to judge have seen some of our deficiencies, it will be useful to refer to a letter written in October, 1948, by Dr. R. S. Morison, Assistant Director of Medical Science of the Rockefeller Foundation, to Dr. E. S. Meyers, Dean of the Faculty of Medicine in the University of Queensland. Dr. Morison had visited the Medical School at Brisbane and Dr. Meyers had asked Dr. Morison for a report on his visit. In place of a report Dr. Morison wrote what he called an informal letter. At the outset he gave several reasons for the view that changes may be necessary in Australian medical education as now constituted. In the first place the character of medical knowledge and therefore of medical practice has changed rapidly in the last twenty years and will change still further. It becomes increasingly necessary that young medical men should be trained to understand how such knowledge develops. The second reason has to do with the increasing demand for more equitable distribution of medical care and with this are coupled an interest in the social factors leading to disease and all that is included in the term preventive medicine. Thirdly, there is an increase in the number of men wishing to study medicine. In the fourth place Dr. Morison referred to the "growing sense of maturity and intelligence of the Australian Commonwealth". This, with changes in other countries, calls for the develop-

ment in Australia of the scientific and post-graduate aspects of medicine on a scale not hitherto contemplated. Dr. Morison found all departments of medical schools in this country understaffed in comparison with standards prevailing in the United Kingdom and North America. In regard to research, he deplored the vague way in which it was related to university life. He found that the universities in Australia do not now occupy the same place of respect and authority that they do in other countries. At the same time he saw an awakening of interest in research and pointed out that this may be utilized by universities to increase their influence and prosperity or it may be ignored by them, in which case they will decline and will become mediocre vocational schools. Another feature mentioned by Dr. Morison is a failure to develop satisfactory relationships between hospitals and medical schools. He holds that teaching, research and the care of patients are the responsibility of a single departmental organization headed by a single individual—he did not realize how important this was until he had seen Australian conditions. He thinks that Australia has a unique opportunity to assume a place of leadership in social medicine because of its homogeneous and relatively small population.

The whole of Dr. Morison's letter has not been covered, but sufficient has been mentioned to support the contention that the Branches of the British Medical Association should urge on the Federal Council the acceptance of Dr. Maddox's suggestion.

Current Comment.

THE ROLE OF POTASSIUM IN DISEASE.

It has long been recognized that potassium is an important body constituent and that it is present in higher concentration in the tissue cells than in interstitial fluid and serum. The reason for this relative concentration has not been explained, but other important findings about potassium have been accumulating in the last few years. Their relationship to an understanding of the role of potassium in disease has been reviewed by T. S. Danowski.¹

Under ordinary conditions, Danowski points out, the potassium levels in extracellular fluid vary to only a limited extent. The usual upper limit may be exceeded in certain circumstances without the implication of abnormality; this has been observed, for example, after the ingestion of potassium salts, and during potassium balance studies conducted with diabetic and non-diabetic subjects. Such increments of potassium in the extracellular fluid are soon eliminated by the kidneys in those subjects whose body stores of the cation are intact. Elimination is effected not only by glomerular filtration, but also, it appears, under certain circumstances by excretion through the renal tubules. Toxic concentrations in the serum may result from a rapid intravenous injection of potassium or occur in disease states with usual or even limited intakes of potassium; factors involved in the latter circumstances are (either alone or in combination) contraction of the volume of extracellular fluid, inability of the cells to take up potassium, transfer of cell potassium to the extracellular compartment and inadequate renal excretion. All the factors, with the possible exception of the transfer of cell potassium to the extracellular compartment, may be operative in producing the hyperkalemia of untreated adrenal cortical disease. The role of these various processes in renal insufficiency is not settled, but recent studies indicate that potassium poisoning can be demonstrated in a minority of patients

with chronic nephritis if they are kept under observation up to the moment of death. The findings appear not to be agonal, since serial observations have revealed the gradual evolution of the changes known to occur with potassium intoxication, namely, progressive changes in the electrocardiogram, especially in the T wave, with at times subsequent heart block. Apparently the potassium levels in untreated Addison's disease usually do not attain the lethal range, and the problem of hyperpotassemia is confined to patients receiving this cation in undue amounts and a minority of those with renal failure. Hypopotassemia, on the other hand, may be associated with a number of conditions. Theoretically it may result from dilution by fluids of low potassium content, loss of the cation in urine or other body fluids, or transfer of potassium into cells; an inadequate intake will maintain the low concentrations. All factors may apply in diabetic acidosis and coma. In the early stages intake is practically nil because of anorexia and vomiting, and much is lost in the gastric secretions and urine. Raised or normal concentrations of potassium in the serum of patients at this stage may be due to contraction of plasma and extracellular fluid volumes from dehydration. With the hitherto standard treatment (administration of large amounts of potassium-free fluids, such as saline and then glucose solution), the volume of body water is reexpanded. At the same time potassium moves into the cells under the impetus of insulin, restoration of carbohydrate catabolism, glycogen deposition and protein formation. The cation continues to be lost in the urine. Thus hypopotassemia usually develops in the early phases of the hitherto standard treatment of diabetic acidosis, though the losses tend to diminish during convalescence. A comparable mechanism appears to account largely for the low serum potassium values found in infants with pyloric obstruction and prolonged vomiting and in many adults with gastro-intestinal disorders. Low serum potassium values sometimes associated with renal disorders may be related to impaired tubular reabsorption, glomerular filtration of potassium being well maintained. As yet periodic paralysis is the only condition in which the decline in extracellular concentration is entirely or almost entirely explicable by a transfer into cells. The physiological effects of hypopotassemia appear to be limited to certain electrocardiographic changes and to the occasional production of a reversible and usually non-fatal muscular paralysis. The fact that the latter does not invariably occur emphasizes the need for a flexible concept in predicting the effects of hypopotassemia. Probably, Danowski states, the chief importance of hypopotassemia lies in the fact that it is frequently associated with deficits of cell potassium rather than in other effects.

Formidable practical difficulties have hindered the investigation of cellular potassium, but certain important facts are known. Concentrations of the cation are about twenty-fold greater in the tissue cells than in the serum. Cell potassium is only partially ionized and hence not all of it is osmotically active; some is bound to protein, some probably to other complexes, the separate fractions varying in amount. The breaking down of cell protein may release potassium to the extracellular fluid; the process is reversed with positive nitrogen balance. With water deprivation potassium not associated with protein moves to the interstitial fluid; this alters the osmotic forces, and water moves to the extracellular phase and mitigates the dehydration there. Potassium moves to the interstitial fluid with liver deglycogenation, and it leaves muscle cells during exercise, to lose its identity and enter other cells or be excreted in the urine. Potassium stores in cells can be altered experimentally and clinically under conditions such as dehydration, hypertonicity, oliguria and electrolyte administration. Temporary increases in cell potassium content following ingestion or injection of potassium salts may be looked upon as physiological adjustment; equilibrium is subsequently attained. A rise in cell potassium content is associated with adrenal cortical insufficiency, periodic paralysis and chronic acidosis induced experimentally in non-diabetic animals. Whether or not such rises are harmful cannot be stated; the absence of definite associated symptoms may be related

¹ *The American Journal of Medicine*, October, 1949.

to the fact that the concentrations of osmotically active potassium are maintained at a constant. Depletion of intracellular potassium is more clearly harmful; it has been demonstrated in various conditions. In the early phases of the treatment of diabetic acidosis or coma the patients continue to lose potassium from cells; but this refers to the net balance of cell potassium, as with insulin administration and resumption of carbohydrate metabolism potassium reenters cells, and loss and reentry must be going on at the same time. Losses of cell potassium have also been recorded with gastro-intestinal disorders and in particular with infantile diarrhoea. In all of these conditions loss to the extracellular compartment must have been accompanied by comparable or greater losses from the body in urine *et cetera* or dangerous extracellular concentrations would have occurred. Such extensive losses of cell potassium may jeopardize survival. In experimental studies degenerative changes have been noted in the myocardium following production of deficits of cell potassium. Moreover, a lowered mortality rate has been demonstrated in infantile diarrhoea with potassium therapy. Cellular deficits of potassium may contribute to the mortality in other clinical disorders, though the mechanisms of harmful effects are not known. Indeed, it is clear from Danowski's review that much remains to be learned about potassium metabolism in the body. What is known, however, shows that it is of vital importance, especially in relation to potassium deficiency.

THE EFFECTS OF THE ATOMIC BOMB.

REFERENCES have been made previously in these pages to the results of investigations into the pathology of casualties caused by the explosion of an atomic bomb. Information has been gained by study of the immediate and late effects of the two explosions in Japan in 1945 and by subsequent experimental work on animals. It will be recalled that in the Bikini experiment animals such as goats and swine, amongst others, were exposed to varying hazards of radiation. Owing to the great difference in the sensitivity of animals to radiation it was necessary to select, for the purposes of test, animals comparable in this respect with man. Individual differences in sensitivity must be also reckoned as a variable: in Hiroshima and Nagasaki this was specially noted among survivors. In order to establish some sort of standard it has been necessary to investigate further the effects of total body irradiation, a subject which has, of course, been already studied. John L. Tullis now reports from the Naval Medical Research Institute, Bethesda, Maryland, a summary of the tissue changes caused by exposure to X rays derived from a million-volt installation.¹ He discusses the findings of the Bikini experiment, and compares these with the less elaborate but more easily controlled radiation of X rays, which produce radiation lesions similar to those of the fission bomb. Of course, there are many other complicating factors with the latter, such as those due to heat, blast and other coincidental forms of trauma. These will be discussed presently. The lesions following total body radiation are, briefly, those due to hemorrhage, necrosis and secondary infection. As is well known, lymphoid cells, myeloblasts, erythroblasts, germ cells and intestinal epithelium are very sensitive. Capillary dilatation occurs, due to tissue anoxia, and these evil effects are intensified by anemia. There is, however, one hope for some persons or animals stricken by such lesions, that they may be kept alive by measures appropriate to tissue anoxia and infection until the more resistant stem reticular cells resume production. Cells at the active mitotic stage are readily destroyed, but the ancestor cells are stouter, and thus we are left with a certain hope that all may not be lost with persons suffering fairly severe radiation effects. Tullis points out that there is evidence from both experimental and field experiences that there is a critical period of nearly thirty days: if death is

inevitable it will probably occur within this period. In the same journal appears an extensive and copiously illustrated review of the pathological findings following the two atomic bomb explosions in Japan. This detailed and documented account by Averill A. Liebow, Shields Warren and Elbert De Coursey is a summarized version of part of a report made to the Surgeons-General of the Armed Forces by the Joint Commission for the Investigation of the Atomic Bomb in Japan.² The authors point out at the outset that many of the factors affecting the victims were not *per se* related to radiation. We know how common and severe burns were; they were due to the effects of all types of radiation, including no doubt those of the infra-red, visible light and ultra-violet parts of the spectrum. Trifling obstructions often protected the skin, and on the other hand dark fabrics often blazed into flame. Fires devastated the stricken cities and the inevitable toll of falling buildings was heavy. Although radiation effects were quantitatively of much less importance in striking at human life and safety by producing immediate casualties, we are at present more interested in the possible results of unleashing such a frightful burst of atomic energy. A vast quantity of ionizing radiations was set free, including γ rays, neutrons, β and α particles and radiation fission products. Fortunately most of the last named were caught in the vast upsurge of the explosion and were dissipated in the stratosphere. However, plenty of harmful rays were left, forming a damaging complex at any point within the range of the explosion and its effects.

The actual dosage was probably very rapid in application. Whether all the effects attributed to radiation were in fact due to this alone cannot be stated yet: it is possible that secondary bacterial infection may have been of some importance. Further experimental work is to be undertaken on this point. Of the tissue lesions found in human beings who were subjected to these perils in Hiroshima and Nagasaki some of the most significant are those affecting the bone marrow, the gonads and the germ plasm. Speculation at once is inevitably directed with concern to the future. To these must also be added the not remote possibility of the development of neoplastic lesions in the sites of treated burns. The ills endured by the bone marrow are perhaps sufficiently familiar, but we may note that clinical evidence in the field gives us some reason to hope that even desperately ill people with maturation or even production of defects of the marrow may yet turn the corner. This one bright spot in the clinical position, referred to previously, seems about the only constructive basis for treatment of some prophylactic value. The latent period between the receiving of obvious traumatic lesions and the more or less stealthy appearance of radiation sickness caused a great deal of confusion in Japan. Is it too heartless to say that next time we should be wiser?

The effects of these explosions on the gonads and the germ plasm have also been examined. All grades of damage were found: it could not always be ascertained whether azoospermia was temporary or not. Nor can the authors offer any definite suggestions as to the genetic consequences of mass radiation on members of a considerable population. They state that experimentally gained knowledge opens our eyes to the possibilities of producing heritable changes in the germ plasm. It would be obviously impossible to do more than speculate on the answers that only time can give to some vital questions. What may be the effect of radiation exposure on the life span of the survivors? Will irradiated children grow and develop normally? Will some of the survivors be permanently sterile? Will mutations and other genetic changes be induced by this mass experiment? Will neoplasia of damaged skin or superficial tissues or leucemia be a sequel of damage by atomic bombs? The authors admit that these questions can be answered only by time, if at all. We may quote W. H. Auden:

Time can but only say I told you so,
If I could tell you I would let you know.

The poet spoke of a malady of the spirit: perhaps we do likewise.

¹ American Journal of Pathology, September, 1949.

² Ibidem.

Abstracts from Medical Literature.

MEDICINE.

Polycythaemia.

J. H. LAWRENCE (*The Journal of the American Medical Association*, September 3, 1949) discusses the control of polycythaemia vera by marrow inhibition. He states that venesection, phenylhydrazine and X-ray treatment have been used extensively. More recently radioactive phosphorus (P^{32}) has been employed. Many of the patients had leucocytosis and abnormal white cells in the blood, including myelocytes. The disease often terminates in leukaemia. The author considers that P^{32} gives good results in the treatment of polycythaemia; he does not give details, but he reports over 100 cases in which he says life has been prolonged by P^{32} . Venesections before the use of P^{32} may be helpful.

Peripheral Vascular Disease.

I. J. GREENBLATT, S. FELDMAN AND J. M. LINDER (*The Journal of the American Medical Association*, September 24, 1949) discuss the use of histamine in a retarding menstruum in peripheral vascular disease. They state that histamine acts as a vasodilator of capillaries and arterioles if injected; with 3% of yellow wax in sesame oil the action of histamine is retarded. Ninety-three patients with peripheral vascular disease were studied. One millilitre of this histamine preparation, containing 0.5 milligramme of histamine base as the diphosphate, was injected intragluteally every day for up to twenty-two days or more. In thromboangitis benefit was recorded in over 50% of cases. In arteriosclerosis obliterans and diabetic arteritis similar benefit was received, and it was said that moist gangrene reacted better to this treatment than to tissue extracts, other vasodilating drugs, the electric cradle or typhoid vaccine. In other cases of diabetes with gangrene, no relief was obtained from pain by histamine injections.

Classification of Epilepsies.

WILDER PENFIELD (*Archives of Neurology and Psychiatry*, August, 1948) states that the immediate or physiological cause of a seizure is the excessive neuronal discharge within some area of the grey matter. If all the conditions which are capable of producing such a discharge are grouped, they may be entitled the epilepsies. The electroencephalogram in 1929 confirmed Hughlings Jackson's hypothesis that a stormy electrical discharge occurs in the brain during a major fit. The author's classification is tentatively divided into those with and those without demonstrable cerebral lesions—or more fully, cerebral seizures, focal cerebral seizures and idiopathic epilepsy. He states that at the first interview, clinical information should be adequate to place the patient into one of these categories. The age of onset will give some indication of the cause of the fits. Up to ten years, trauma, degeneration and febrile thrombosis are frequent causes. Particularly in the ten to twenty years

age group idiopathic epilepsy is of frequent occurrence. Subsequently, trauma, neoplasm and arteriosclerosis are most common. Investigations include simple X-ray examination of the skull, which may show smallness of one lateral chamber, suggesting injury to the hemisphere in infancy. With pneumoencephalography, expanding lesions will show by displacement of the ventricular system away from the lesion. Scars and atrophy give enlargement to the underlying ventricle and may be associated with displacement of the whole ventricular system towards the side of the lesion. Electroencephalographic abnormalities were found in 90% of cases of traumatic epilepsy and in 70% of cases with a fairly superficial focus. The seizure pattern, particularly in the beginning of the fit, is of importance in localization. In the majority of cases minor fits are present in addition to major fits. These minor reactions take place in the highest level of neuronal integration, from which different pathways diverge; anatomically these are in the basal ganglia and have widespread bilateral connexions. Seizures commencing in adult life should as a rule indicate investigation for cerebral tumour, hypoglycaemia and general medical causes. Conservative treatment is usually recommended. Only when a focus can be identified by clinical observation and special tests is it considered advisable to suggest surgical excision; complete or partial freedom from attacks can be expected in 50% of cases.

Parkinsonism.

L. J. DOSHAY AND KATE CONSTABLE (*The Journal of the American Medical Association*, August 27, 1949) describe a new treatment for Parkinson's syndrome. A series of 117 patients were treated with a new drug called "Artane", apparently a phenyl derivative with a long formula summarized as trihexyphenidyl. A dose of two to fifteen milligrammes per day was employed in both arteriosclerotic and post-encephalitic Parkinsonism. No ill effects were noted. The drug resembles atropine in its action, but has none of its toxic effects. "Artane" is supplied in two-milligramme and five-milligramme tablets.

Pleural Effusion Complicating Artificial Pneumothorax.

A. LÉVI-VALENSI AND A. PÉREZ (*Revue de la tuberculose*, Volume XIII, Numbers 5-6, 1949) have treated patients with serous pleural effusions occurring in the course of artificial pneumothorax by the daily intrapleural injection of 20 millilitres of a 2% solution of procaine. In 24 cases out of 34 in which treatment commenced within forty-eight hours of the onset of symptoms, the fever, discomfort and effusion disappeared within five days. In six cases in which treatment was delayed it was unsuccessful. Similar treatment was applied with frequent success for effusions following internal pneumonolysis.

Primary Bronchogenic Carcinoma.

JOHN J. O'KEEFE (*Archives of Internal Medicine*, October, 1948) presents an analysis of 131 cases of proved primary bronchogenic carcinoma, and correlates the data with those in the recent literature. He states that

statistics support the view that the incidence of this disease is absolutely as well as relatively increasing. It is predominantly a disease of white men, the greatest incidence occurring between the ages of forty-five and sixty years; it has a definite predilection for the right lung, and the average life span of patients not amenable to surgical treatment is twelve to eighteen months. The practice of the cytological study of bronchoscopically removed secretions promises to increase the recognition of early cancer of the lung by an appreciable margin. Management of patients with this neoplasm entails the evaluation of several factors: the location and degree of extension of the primary growth, the presence or absence of secondary obstructive phenomena, and the presence or absence of detectable metastatic lesions. There are three therapeutic methods of attack: bronchoscopic, radiological and surgical. Surgical extirpation of the involved lung is the only method offering possible cure.

"Abortive" Treatment of Tuberculosis with Streptomycin.

G. L'ÉTORE (*Revue de la tuberculose*, Volume XIII, Numbers 7-8, 1949) has treated with streptomycin some twenty patients with very early tuberculous disease with affection of the lung, apparently in its initial phases. In every case the administration of one gramme each day of the drug produced clearing away of the lesions in a few days. The total dosage did not exceed 15 to 20 grammes.

Adrenal Cortex and Arterial Hypertension.

NORMAN SAPEIKA (*Archives of Internal Medicine*, September, 1948) presents a paper on the adrenal cortex and arterial hypertension in which a critical survey of the literature dealing with hypertension is made. Among the causes of the disease that have been advanced are (a) a primary disturbance in the vascular system, (b) abnormal endocrine secretion, (c) abnormal sympathetic discharge from the higher autonomic (hypothalamic) centres, and (d) the liberation of excessive amounts of a pressor substance produced by the renal epithelial tissue. The author states that until further evidence becomes available, it is best to regard hypertensive vascular disease as non-renal in origin. An attempt is made in the present study to show that the adrenal cortex plays a major role in arterial hypertension, and many experimental and clinical data are submitted. However, while there is much evidence for this point of view, final proof must still be awaited. Hyperactivity of the nervous system is not the primary cause of arterial hypertension, and there is no evidence that the sympathetic system is important in the causation of hypertensive vascular disease. The operation of bilateral lumbo-thoracic sympathectomy must be regarded as a non-specific symptomatic treatment of the disease. The autonomic nervous system, with the central autonomic nuclei, plays a part in maintaining arterial blood pressure, and in elevating or depressing it, and this neurogenic element is a factor in the early phase of hypertension; but it is reinforced or replaced later by a humoral mechanism. Most research has sup-

ported the view that a chemical substance liberated by the kidneys elevates the blood pressure, but there is a growing body of acceptable evidence against the concept of a primary renal "ischemic" origin of human hypertensive vascular disease. It is believed that arterial hypertension is the result of narrowing of the arterioles in major vascular fields, and this constriction may result from various humoral mechanisms. Pressor substances at present incompletely identified may circulate in the blood, causing narrowing of the arterioles and thus increasing the blood pressure. The author tabulates reports indicating the significance of the adrenal cortex in arterial hypertension. Bilateral adrenalectomy abolishes experimental renal hypertension, and the hypertension can be reproduced if the completely adrenalectomized animal is given cortical extract. The renin substrate hypertensinogen is a globulin formed in the liver and possibly in the adrenal cortex, and decreases or disappears from the systemic blood of untreated adrenalectomized male dogs, whereas adequate doses of adrenal cortex hormone or of desoxycorticosterone cause a return of hypertensinogen to a normal level. Bilateral adrenalectomy decreases the response to injections of renin, and prevents the appearance of a substance like angiotonin in the blood when experimental hypertension is produced in the dog by injection of kaolin into the cerebral ventricles. Adrenal cortex tissue, or certain of its hormones (desoxycorticosterone), seems necessary for the existence of "renal" hypertension, and for the maintenance of normal arterial pressure. Hypophysectomy or adrenalectomy in rats with "renal" hypertension causes a fall of blood pressure; this is restored to the original level after hypophysectomy by administration of adrenocorticotrophic hormone, and may be partially restored after adrenalectomy or hypophysectomy by the administration of adrenal cortex extracts or desoxycorticosterone, but not by the use of such steroids as progesterone, testosterone or estradiol. Ligation of vessels to an adrenal gland produces sustained hypertension in dogs comparable with that produced by the Goldblatt method. Successful reduction of the systolic and diastolic pressures for months has been obtained in cases of hypertension by subtotal bilateral adrenalectomy. The raised blood pressure in cases of Cushing's syndrome due to carcinoma of the adrenal gland has returned to normal after removal of the tumour.

Allergy and the Psyche.

FRANK C. METZGER (*The Journal of Nervous and Mental Disease*, March, 1949) mentions the case of a young woman with giant urticaria. She was sensitive to aspirin, that sensitivity was eliminated, and she improved; but she had an attack of hives which developed every time the author entered the office wearing a white coat, also every time she saw a man with his collar on backwards (a preacher or priest), in spite of her "no-drug" régime. The hives were usually accompanied by a crying spell. She did not get the hives if the author left off the white coat. The author gives examples of asthma and hay fever which had equally clear-cut psychological relationships. With Horne he believes that "an allergic

individual has a mind, and if it does not function in the proper channels it can affect the part of the body one is treating". In his cases 50% of asthma and hay fever patients and 92% of giant urticaria patients had psychoneurotic symptoms. Many of his patients were children who admitted "a fear of the consequences and criticisms from their parents, their teachers or their companions if they did not pass or make the honour roll". The author pleads for attention to the whole picture of the allergic individual. It is not sufficient to remove the allergen, one must attack the complicating emotions.

Survival after Recent Myocardial Infarction.

L. N. KATZ, J. Y. MILLS AND F. CISNEROS (*Archives of Internal Medicine*, August, 1949) discuss survival after recent myocardial infarction, and analyse 507 cases of recent myocardial infarction for the purpose of determining the factors concerned in long-term prognosis. It was found that the mortality rate was greatest in the first two months and lessened progressively. It was high for the first year, and remained fairly steady from the second to the fifth year. By the end of the fifth year to the sixth year, 81% of the patients were dead. One-fourth of the patients died in the first two months, about one-half had died at the end of a year, about two-thirds at the end of the third year, and approximately four-fifths at the end of five years. Thus the survival rate varied from 72% for the first two months and 55% for the first year to 16% for five years. Of 52 patients who died after the second month following infarction in which the cause was known, 19% died of heart failure, 6% of pulmonary embolism, 65% of a new myocardial infarct, and 10% of miscellaneous causes. There were no deaths after the first two months from cerebral apoplexy or renal insufficiency. It is concluded, therefore, that a new infarct is hazardous, and ill effect is most frequent in the first year of the illness. Hypertension had no effect on the mortality rate in the first two months, but caused a slight increase in the long-term mortality. The presence of *angina pectoris* at the time of the patient's admission to hospital, and up to one month preceding admission, had no deleterious effect on the immediate mortality in the first two months, but the average duration of life of those who died after two months was somewhat shortened. The presence of heart failure on the patient's admission to hospital sharply increased the immediate and over-all mortality rate and shortened the duration of life of patients who died after two months. The presence of *diabetes mellitus* increased the mortality rate in the first two months, and also the over-all mortality rate. Low voltage, sinus tachycardia, heart block and ectopic rhythms in the electrocardiogram on the patient's admission to hospital increase the mortality rate in the first two months, but not so after the first two months. Patients who were symptom-free on admission had an immediate mortality rate little different from that for the entire group, but the long-term mortality rate was better. Therefore, those who are asymptomatic on admission have a definitely more favourable outlook after the first two months. Older patients

were more adversely affected by myocardial infarction than the younger ones. The immediate mortality rate was greater in women than in men, but after the first two months the mortality rate was less for women than for men. However, the over-all mortality rate was higher for women than for men. The mortality rate after the first two months of the illness was definitely less for infarcts on the lateral wall than for those on the anterior or the posterior wall. Little difference was noted in the mortality rate after two months between infarcts on the anterior and those on the posterior wall. The mortality rate was greater for the whole group when the electrocardiogram was classified as an atypical coronary pattern.

Thyreotoxic Heart Disease.

C. R. GILMOUR AND M. B. WALTERS (*The Canadian Medical Association Journal*, October, 1949) discuss thyreotoxic heart disease and review 33 cases of this condition. The disease was noted mainly in elderly people, most being over fifty years of age. The sex incidence was two females to one male. The majority of cases were associated with adenomatous goitre, and often with adenomata undergoing degeneration. The authors discuss whether there is a hypersecretion or an abnormal secretion of the thyroid gland in thyreocardiac subjects, and incline to the latter viewpoint. It is also recognized that many of these patients are suffering with organic heart disease which is not productive of symptomatology until the added burden of thyreotoxicosis results in *angina pectoris* or cardiac irregularities, these being relieved by removal of the thyroid gland. The most common cardiac disturbance was auricular fibrillation, and it was noted that when thiouracil did not stop the arrhythmia, subtotal thyroidectomy might do so. Unless the heart was enlarged clinically and radiographically, the presence of cardiac murmurs was not accepted as evidence of organic heart disease. The authors stress the advantage of loading the liver with glycogen in the pre-operative treatment of this disease, and recommend a diet of high carbohydrate, high protein and high Calorie content, with "forced" glucose drinks before operation. Also their patients are given glucose intravenously at a slow rate before and after operation, to ensure adequate mobilization of the glucose by the liver and heart muscle. Vitamin B complex is also administered in large doses as an aid in restoration of damaged liver function. The hippuric acid test for assessing liver function was not found satisfactory; every patient is assumed to have liver damage present. Quinidine was avoided pre-operatively, and digitalis was used only in the presence of congestive heart failure. All patients were given sodium iodide intravenously as well as glucose post-operatively, and Lugol's solution was administered in decreasing dosage for variable periods of time. The authors are of opinion that digitalis is neither useful nor safe in thyreotoxicosis, and that it has little or no effect on cardiac function. All the authors' patients who developed auricular fibrillation for the first time post-operatively, reverted to normal rhythm spontaneously within three days with the use of no medication except iodine and intravenous glucose therapy.

Special Article.

(CONTRIBUTED BY REQUEST.)

THE ERYTHROCYTE SEDIMENTATION RATE.

THE introduction of a test dependent on the stability of the suspension of erythrocytes in citrated blood by Fahraeus in 1918 was for the purpose of detecting the presence of pregnancy; but the widespread use of the test soon indicated that there were many conditions entirely unrelated to pregnancy which influenced the rate of sedimentation of erythrocytes. The test has, in fact, become a routine procedure in determining the progress of certain chronic infections and is often of considerable diagnostic value; but unless a careful and standardized technique is observed in the carrying out of the test, and variables are understood, interpretations of results are apt to be fallacious.

Reference to text-books on hematology or laboratory procedures will provide full details of different methods of performing the test—for example, Rourke-Ernstene, Wintrobe-Landsberg, Westergren, Linzenmeyer, and Cutler. The variables are the type of sedimentation tube, the anticoagulant, the method of timing, correction for erythrocyte concentration, and normal range and abnormal range of sedimentation. It is therefore essential always to know the method employed in any individual instance and to be informed regarding the range of normality before an attempt is made to interpret the significance of any result, and scrupulous attention to details must be observed by the person who carries out the test. The methods most frequently employed here are the Westergren and Cutler tests. These have the advantage that it is unnecessary to make corrections for minor variations in erythrocyte counts, and the graphic method of Cutler provides a curve which plots the distance of fall at five-minute intervals. There is quantitative measurement of the slope during the period of constant fall, and of the distance of fall in millimetres in one hour. Cutler's test can readily be performed by a general practitioner.

The sedimentation of erythrocytes is dependent upon physico-chemical forces. Erythrocytes suspended in plasma or serum always form rouleaux which vary in size; and the rate of sedimentation increases in proportion to the size of these aggregates. The degree of aggregation and rate of sedimentation correlate roughly with the concentration particularly of plasma fibrinogen (Ham and Curtis, 1938) and of serum globulins, but the exact physico-chemical mechanism of aggregation is not established. There is always an initial period of progressive acceleration of the rate of sedimentation followed by a period of constant fall when aggregation of the cells has reached its maximum, with finally a retardation coincident with "packing" of the cells.

Variations in the sedimentation rate do not occur only from differing techniques, but also differences in erythrocyte concentration and size cause significant changes. Correction for the two last mentioned is necessary with some techniques if accuracy is desired, especially if the erythrocyte cell volume is low or if the count is less than 4,000,000 per cubic millimetre. The effect of size of the cells correlates with mean corpuscular volume. The variable factor most frequently associated with acceleration in rate is an increase in the concentration of plasma fibrinogen. Increase in serum globulins may increase the rate.

Within the normal range certain physiological states affect sedimentation. Thus no sedimentation is found at the end of one hour in the blood of the newborn infant, but opinions differ regarding the rate in early infancy. However, the normal adult rate is not surpassed. The ranges for techniques mentioned above are as shown in Table I (Ham and Curtis, 1938).

It is evident from the table that sex influences the sedimentation rate. The female also shows a rhythmical variation with a pre-menstrual increase, which, however, does not exceed the normal range unless a pathological lesion is also present. The rate is often increased after the tenth to twelfth week of pregnancy and returns to normal during the third week of the puerperium. Sometimes a slight retardation may follow ingestion of food.

In clinical work, one great value of the test lies in the fact that its result is consistently normal during health. It may also be normal in the presence of pathological lesions which do not produce inflammation or active tissue destruction, such as disorders of function, neuroses, metabolic disturbance, innocent tumours, asthma, emphysema, peptic ulcer, deficiency disease, and cardio-vascular disease without cardiac failure, thrombosis or active syphilis. On the first day of an acute infection, the rate may be normal.

The sedimentation rate is always retarded in congestive cardiac failure from whatever cause, and in the presence of severe cyanosis the same effect is found (Walton, 1933). These states can therefore mask evidence of active disease. On the other hand, in all cases of nephritis an increased rate is found. The rate is usually abnormal in pathological conditions associated with active inflammation and tissue destruction, such as infections (acute or chronic, local or general), severe trauma, leucæmia, malignant neoplasms, lymphoma, some diseases of the liver with jaundice, active cardiac disease (syphilitic aortitis, rheumatic carditis, sub-acute bacterial endocarditis, coronary occlusion), visceral infarction, and thrombosis. In malignant hypertension the rate is increased, but probably renal disease is responsible for this; the same explanation applies in all probability in hypertensive cardiac disease and in some cases of subacute bacterial endocarditis. The fact that "angina of effort" does not cause an increased rate, whereas "angina of rest" results in an increased rate, is indicative of the occurrence of tiny infarcts of the myocardium in the latter condition. However, just as the rate may be normal on the first day of an acute inflammatory lesion, so may the rate be unaltered at the onset of coronary occlusion or other infarction despite the presence of pyrexia and leucocytosis.

As a diagnostic procedure, the test is of value in differentiating a malignant from a benign tumour, because it detects the presence of tissue damage. In a chronic infection the result is often abnormal despite the absence of fever, leucocytosis, tachycardia or other signs of infection. An abnormal rate must entail a search for the cause. An abnormal rate reappearing during convalescence from an illness involves a search for some complication, and a delay in the post-operative return to normality ten to sixteen days after operation indicates a superadded lesion.

As a guide in treatment and prognosis the test is of great value because it is often the last test whose result returns to normal. Particularly in tuberculosis, rheumatic fever and chronic arthritis repeated estimations of the sedimentation rate are a guide to progress, and quiescence should not be assumed despite other indications of arrest of the disease, until the erythrocyte sedimentation rate is normal. In cardiac lesions, while the test is of value, the misleading effect of impending or evident congestive failure must be remembered.

TABLE I.

Method.	Correction for Erythrocyte Concentration.	Normal Range.	Abnormal Range.		
			Slight.	Moderate.	Extreme.
Rourke-Ernstene	Required.	0.05 to 0.4 millimetre per minute.	0.4 to 0.6 millimetre per minute.	0.6 to 1.0 millimetre per minute.	2.0 to 2.5 millimetres per minute.
Wintrobe	Required.	0 to 9 millimetres (male). 0 to 20 millimetres (female).	9 to 15 millimetres (male). 20 to 25 millimetres (female).	15 to 30 millimetres.	33 to 50 millimetres.
Westergren ..	Optional.	1 to 3 millimetres (male). 4 to 7 millimetres (female).	8 to 15 millimetres.	15 to 40 millimetres.	80 to 110 millimetres.
Linzenmeyer ..	None.	200 to 600 minutes.	100 to 200 minutes.	60 to 100 minutes.	15 to 30 minutes.
Cutler	None.	2 to 8 millimetres (male). 2 to 10 millimetres (female). "Horizontal line."	"Diagonal line."	"Diagonal curve."	"Vertical curve."

In conclusion, it may be stated that careful estimation of the erythrocyte sedimentation rate is a non-specific test of considerable value as an adjuvant in diagnosis, and in the management of chronic infections; but a knowledge of factors influencing the rate is essential in the interpretation and application of the test. A normal sedimentation rate does not exclude the presence of active and even progressive disease; but a normal person has a normal rate. An abnormal rate is indicative of disease and is secondary to alterations in some constituents of the blood. The interpretation of the test really depends on the significance of the abnormalities in plasma, serum or erythrocytes which are directly responsible for an increase in the sedimentation rate. It still requires elucidation.

G. A. PENINGTON, Melbourne.

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British Medical Association News.

SCIENTIFIC.

A MEETING of the South Australian Branch of the British Medical Association was held on October 27, 1949, at the Verco Theatre, Institute of Medical and Veterinary Science, Adelaide, Dr. C. O. F. RIGGER, the President, in the chair.

Common Dermatological Problems.

DR. W. C. T. UPTON read a paper entitled "Some Everyday Problems in Dermatological Practice" (see page 295).

DR. TREVOR TURNER, first discussing psoriasis, said that rational treatment depended on a knowledge of aetiology, and there lay the difficulty of treating psoriasis. In typical cases few conditions were easier to diagnose or harder to treat. The statement made by Dore and Franklin underlined Dr. Upton's reference to the cause of psoriasis: "In spite of every investigation—statistical, sociological, biochemical, bacteriological and histological—the cause of psoriasis is still unknown." That statement had been made in 1934, and no firm progress had been made since. The most recently stated viewpoint was that of Barber, during the 110th annual meeting of the British Medical Association in June and July, 1949. Barber considered psoriasis to be a non-specific reaction of the skin to various kinds of stimuli occurring in a person with a latent error in the keratinizing mechanism. It followed that there was no specific treatment. However, there was no doubt that many psoriatics could be greatly relieved by simple and regular treatment. Neglected psoriasis could become a burden and an annoyance. A period of intractability did not necessarily mean absolute chronicity and severity, and none should be deprived of the help that treatment could give. The acute guttate form usually responded better than the chronic form. Dr. Turner thought that in general practice treatment could go a little beyond the use of keratolytics as indicated by Dr. Upton. A clean application for chronic patches was a tar paint such as coal tar one part, benzene two parts and acetone eight parts. In the acute phases sedative pastes or lotions should be used—for example, zinc or calamine. Dr. Turner said that recently he had tried pyridoxin (vitamin B₆) and ascorbic acid at the Royal Adelaide Hospital, but there was no constancy in response, though it seemed that some patients had been helped. That by no means exhausted the great lists of medicaments for external and internal use that had been suggested on the basis of the alleged manifold causes of psoriasis; but a first line of attack had been provided.

With reference to *acne vulgaris*, Dr. Turner said that he agreed with Dr. Upton that to say "you will grow out of it" was not the best attitude to take to an adolescent who was sufficiently concerned to consult a dermatologist, or to the adolescent's parents. Acne was a major problem to a minor. He (or she) probably would grow out of it; but that might not occur till both the face and the mind (to say nothing of the chest and back) had been grossly scarred. Though there might be vitamin deficiency and infective factors, one fact dominated all aetiological considerations—androgens

favoured and oestrogens inhibited the development of acne. In the female the source of the androgens was considered to be the cortex of the adrenal. The greater the ratio of androgens to oestrogens, the greater the likelihood of acne. The use of testosterone in castrates and cryptorchids could produce artificial puberty with increased activity of the sebaceous glands, blackheads and in some cases the appearance of acne papules and pustules. With regard to treatment, Whitfield considered that in practically every case acne could be cleared up by X rays, but that it would surely recur if other local and general measures were neglected. On the other hand, considerable improvement could be effected without the use of X rays, but progress was slower and less certain. Dr. Turner went on to say that his own routine steps were the use of the acne drill and lotion suggested by Dr. Upton, the administration of 0.5 milligramme of stilbestrol three times a day for about six to eight weeks, and the exclusion from the diet of chocolates and cocoa. Sometimes vitamin A, 100,000 units per day, was given in addition. Occasionally the male breast might become enlarged and tender, but it soon returned to normal when the administration of stilbestrol was stopped. Dr. Turner said that he had been pleased with the use of stilbestrol. If infection was present, the systemic administration of penicillin with local drainage if necessary was useful. Most patients who were referred to dermatologists needed X rays. His practice was to use 110 kilovolts at a distance of 30 centimetres with or without one millimetre of aluminium according to the degree of induration present (half-value layer 1.2 or 1.9 millimetres of aluminium), and give a dose of 90r at intervals of ten days for six to eight treatments. In "Modern Trends in Dermatology" it was agreed that treatment should be adequate and prolonged, and the use of the following factors was advised: 100 kilovolts, one millimetre of aluminium filter, and a weekly dose of 100r to a total of 1000r to 1200r. Croxon Deller had said: "There seems to be no simple remedy for this all too common condition."

Dr. Turner went on to discuss plantar warts. He said that from a dermatological viewpoint, X-ray treatment was undoubtedly the cleanest, quickest, least painful and generally most effective. He usually used 1700r at 110 kilovolts with a half-value layer of 1.2 millimetres of aluminium. Some authorities suggested a dosage up to 3000r. A recent American method was to give 2800r through two circles—1200r through the smaller and 1600r through the larger. In the absence of X rays, curettage and the cautery had been employed, but the treatment was rather disabling and healing was slow. By accident, it was found that to soak the warts (especially the "mosaic" or grouped type) in a 3% solution of formalin for fifteen to twenty minutes per day would sometimes remove them. Treatment had to be continued for a month or more. For children, a clean and effective application was found to be a 4% to 8% concentration of both salicylic acid and formalin in spirits; it was sometimes used in conjunction with green iodine of mercury pills, one-sixth of a grain three times a day. If a wart did not come away completely, packing of the cavity with salicylic acid (50%) in zinc paste might complete the disintegration and allow it to be curetted out.

Dr. Turner then referred to industrial dermatitis, a problem which he said would increase with South Australia's expanding secondary industries. Most cases came from the metal or chemical industries. He felt that insurance offices generally were inclined to give the workman his dues and sometimes more than his dues in the form of ex-gratia payments. Although they were accepted as occupational, Dr. Turner was sure that some conditions arose because of the cleansing agents used after work—for example, kerosene, abrasive soap—and not because of the materials actually used in the course of the work. That observation emphasized Dr. Upton's statement about cleansing facilities at work. The new man on the job was commonly a candidate for industrial dermatitis. The trouble usually appeared within one month in those who had a specific or non-specific sensitivity, or who used a primary irritant. On the other hand, "wear-and-tear" dermatitis due to exhausted tolerance might not appear till after years of contact. From the viewpoints of pathological processes and treatment, industrial dermatitis was no different from any other form of contact dermatitis contracted apart from occupation. But if dermatitis occurred on exposed or other susceptible parts, particularly in new workmen, if it decreased when the patient was away from work and recurred when he returned, the presumption was that it was occupational in origin, whether the precise cause could be determined or not. There was one factor on which a diagnosis of industrial dermatitis could be made. Special attention should be paid to the history and to the site of the eruption. The appearance of the condition was no different from a similar

lesion produced apart from occupation. Dr. Turner said that in his experience the conditions most commonly to be differentiated were seborrhoeic dermatitis, fungous infection, *pityriasis rosea* , toxic eruptions and contact dermatitis due to non-occupational causes. Sometimes it could not be done; in such a case the workman got the benefit of the doubt.

Finally Dr. Turner referred to over-treatment. In emphasizing Dr. Upton's remarks, he said that a senior colleague of about forty years' experience had remarked that in no other branch of medicine was treatment so overdone as in skin conditions, often with dire results. Apart from the chemist, "the lady next door", "grandma", "a fellow at work" (especially "the first-aid bloke") and at times the works nurse were common sources of suggestions about "what to put on it". To Dr. Upton's list Dr. Turner would add strong tar paste and a widely advertised proprietary ointment, which he considered was the friend of the dermatologist. He emphasized that there was neither ignorance nor indignity in ordering simple zinc paste or calamine lotion. Those, along with a few simple directions, had often produced rapid and astonishing relief in many cases of dermatitis which had been treated with "everything under the sun".

A MEETING of the New South Wales Branch of the British Medical Association was held at Broughton Hall Psychiatric Clinic, Leichhardt, New South Wales, on November 17, 1949. The meeting took the form of a series of clinical demonstrations arranged by the medical superintendent, Dr. GUY LAWRENCE. Parts of this report appeared in the issues of January 7 and 28 and February 4 and 25, 1950.

Paraphrenia.

Dr. Lawrence presented a group of patients with paraphrenia.

Persecutory Type.

The first of this group, a single man, aged fifty-seven years, a shopkeeper, had been admitted to the clinic on August 11, 1949. His early life had been uneventful, but there was a history of a nervous illness at the age of twenty years; he did not go into hospital. He had done well for himself in life, and was in a comfortable position financially. He was a masturbator. His present trouble had begun in September, 1948, when he returned to a public lavatory he had used in search of a lost lighter. He had the delusion that he had been watched by the police, who hired cripples to follow him on account of his homosexual activities. He felt that he was hunted, and was an object of public discussion. He claimed that he could never attract women; people used to call him a woman-hater. He had had a girl friend, really by accident, four years before, but she was hunted from a guest house because of her associations with him. Suicide had occurred to him as an escape from people who threatened to bash him, and he was afraid to speak. He did not hear actual voices, but obtained his information by signs from the persons involved, for example, a man giggling might mean that he was recognized and was to be followed. He had come to the hospital, he declared, because the police wanted him to do so, and their secret agents passed the news to him in some strange manner. He was well held together, and his overt conduct was very reasonable.

Dr. Lawrence's comment was that the patient's mother had died at the age of seventy years of cardiac disease. Since that time he had not been happy, and had withdrawn more from female society. He showed the unresolved Oedipus complex and its repressed homosexuality by the avoidance of women and heterosexual intercourse. In that respect he was narcissistic, and onanism satisfied him. Probably the overt homosexual trend was near the surface, and he connected his early symptoms with his visit to a male lavatory. He did not drink to excess and had no vices that had been disclosed. The ideas were strongly developed, and it did not seem likely that more than a remission would be obtained in his case.

The next patient, a married woman, aged thirty-six years, the mother of one child and the wife of a journalist, had been admitted to the clinic on June 30, 1949. She was the eldest of six siblings, and had always been a thin, very sensitive child. She had had scarlet fever and trachoma in her youth, also measles, chicken-pox, dengue fever, blepharitis, pyelitis on several occasions and anaemia; she had undergone two tonsillectomies, cholecystectomy and appendicectomy later on. She was reserved, was not a good mixer and, in general, appeared to be an introvert. She had one child, and practised no contraception. In 1946 her brother

had died while on military service, and that shock appeared to act as the precipitant of hidden ideas. She took "turns" in which she could only just stagger about, and she would fall at times (it was believed that the "turns" were caused by overdoses of sedative drugs). She developed delusions that her neighbours were intruding into her business; she said that they were insane and intended to murder her. She complained to the police several times. She had hallucinations of hearing, and listened to many people's voices arranging plots against her. She felt that neighbours read her thoughts, and she in turn read theirs; she herself had often thrown visions on their walls. She refused food, saying that the meals were poisoned, and she became emaciated, weighing six stone on admission to the clinic. She claimed to be a mental telepathist, and said that there were many others in the clinic, and that the air was exceedingly tense. After a period of treatment of supporting nature, her bodily state improved, and she was given electroconvulsive therapy. She improved, but soon gave expression to a fresh set of delusions—that she was under the influence of "The Control Room" and that her thoughts were broadcast world wide; if that was widely known, she would be cruelly killed. She was very reticent over the matter—the latest idea—and whispered it to Dr. Lawrence. She had been taking heavy doses of chloral and phenobarbital by the process of drinking bottles of medicine at home very quickly. She also took "Sedormid". She had made a suicidal attempt recently by tying a cord around her throat in order to be free of her tormentors.

The comment made was that the patient exhibited the symptoms of severe paraphrenia, and a cure was extremely improbable. Her general health had not been bad, but she was difficult with food. Paraphrenia was a deteriorating disease, and it appeared probable that the patient would ultimately have to be certified and placed in a mental hospital. She was lacking in insight, and acted under the influence of her delusions. Her mother had been a very neurotic woman, and her father had had peptic ulcers and kept the home disturbed. The history of neuropathy lay there. Dr. Lawrence pointed out that Meyer stressed the fact that people of the patient's type did not adapt their personal thoughts and their extensions to the real facts; they tended to isolate themselves, and were unduly sensitive to the opinions of others; they failed to verify their suspicions, and their realization was inadequate for correction. Freud claimed a weakening of defences against repressed self-reproaches, which returned in part to the consciousness, but by the mechanism of projection were then ascribed to others with hallucinations and delusions of many kinds.

Amorous Type.

The next patient was a single woman, aged forty years, a domestic, who had been admitted to the clinic on August 26, 1949. She had been born in Shanghai, of British parents, and her mother had died when she was eight years old. After that, her childhood had been sad; she had had a hard life. During the war she had been in some sort of concentration camp in the Far East, and had come to Australia two years before the meeting. She had worked at the Marrickville Hospital, and found out by accident that doctors were operating on her brain, that wireless messages were about her, and that the papers often had messages concerning her. Voices were turned on her all the time, and as a result, doctors made her right kidney jump up and down. In April something snapped in her back and it was her kidney bursting. She said that she went out with a man in a car one night, and he drugged her. She did not recall any coitus, but she said that it must have occurred because next day all her work mates talked about how she was to have a baby. She screamed three times a month after that, and at the third scream there was a loud snap; that time it was the vagina. At present she claimed that she was married and divorced. She lacked insight, and was very worried by the things going on in her own private world.

It was pointed out that her early life had been very rigid and correct, in the home of strict Jewish parents. She had not had any love affairs, but had had recourse to heavy masturbation. She was at times depressed and restless. She projected her strongly repressed sexual wishes on to others, and secured gratification by an unreal rape while supposedly drugged. She felt that men desired her keenly, and represented the woman who might easily lay a charge of sexual assault against a man. She had some other persecutory delusions, but they were somatic and also connected with the abdomen. She was suffering from amorous paraphrenia. The outlook was only fair; it was not known how long the symptoms had lasted.

Another patient with the same type of condition, a married woman, aged sixty years, had been admitted to the clinic on September 6, 1949. She had two children, aged thirty-two and thirty-five years. Her father, one brother and two sisters drank heavily, and one brother had heart disease. The patient was the third of six children in the family of a mine manager. She had had a happy home life, was good at school, and was a governess until she married at the age of nineteen years. Her married life was fairly happy; her children were healthy; the menopause had occurred at the age of forty-five years. For several years the husband had been neglecting her and going out alone, and he was suspected of having become sexually promiscuous. The patient had become sexually frustrated, but had repressed her libidinous desires, and they had begun to be projected upon the male sex. Three months before the meeting she had seen a flashily dressed man—a little drunk—sitting on the footpath, and she had gazed at him. She felt she should not have done that, being "a most respectable lady". She had seen him several times after that, and used to cross the street to avoid being seen by him. She claimed that he followed her about and said that if she went into a shop he waited outside with his back turned to her, waiting for her to address him. One day, she claimed, he raised his eyes and looked at her. She knew that he intended to rape her at the first chance, because she heard a voice warning her of that. He wore a black hat, and she saw visions of that hat in her house; not his face. She explained the discrepancy by saying she was too respectable to see a man's face.

Dr. Lawrance pointed out that the patient had delusions of persecution, namely being followed and raped, and hallucinations of voice and visions. She was suffering from amorous paraphrenia. The husband had informed Dr. Lawrance that nine years previously she had shut him out of the bedroom, and had suffered no coitus since. She had lost heterosexual urge after the menopause, and so shut the husband out. The homosexual desire had made itself felt, but the repressions were too strong, and she projected them on to the man in the black hat.

(To be continued.)

Special Correspondence.

NORTH AMERICAN LETTER.

FROM OUR SPECIAL CORRESPONDENT.

This communication is going to deal with the problem of alcoholism in the United States as it is being encountered by medical men. The problem is an old one, but the bed shortage in all types of cases, medical and surgical, has made it increasingly difficult to treat alcoholics as if they constituted medical problems within hospitals. Medical opinion is beginning to cry out against the exclusion of these patients by voluntary care plans and other prepaid medical and hospital schemes.

New York State furnishes a typical sample of what the dimensions of the problem are, and what constructive measures can be taken through medical society initiative. Ten years ago, a survey in Erie County, New York State, showed that alcoholism cost the 798,377 residents of the county the following amounts: cost of handling in the courts of 5308 alcoholic cases, \$18,578; penitentiary costs for 1135 persons, \$97,383; probation costs, \$13,400; county hospital costs (5196 patient days), \$18,186; State mental hospital costs for 24 committed alcoholics (15 of them likely to be a perpetual charge on the State), \$15,096. Thus 7280 alcoholics apprehended cost the country a total of \$162,616. If none of these were "repeaters", it would mean that one person in every 110 in the county provided a serious alcoholic problem.

The above figures fail to include economic losses to the patient and his family, social service costs, or criminal proceedings when felonies were committed by alcoholics.

A survey by the New York State Department of Health brings to light the fact that this State, with a population of 13,000,000, has 280,000 excessive drinkers, and 70,000 chronic alcoholics. For the entire nation, therefore, a rough figure may be had by multiplying these figures by ten.

These findings, together with some bitter war experiences, have caused medical men in Erie County to set up a committee on alcoholism within their own medical society. In the city of Buffalo they found that not a single hospital

would take alcoholics, and after medical representations were made, all eleven hospitals in the city agreed to reserve at least two beds for emergencies. The next step was to organize a treatment and rehabilitation pilot unit, as a demonstration of what could be done with a little initiative and with only a fraction of the money now being spent in the apprehension *et cetera* of alcoholics. The University of Buffalo medical school agreed to foster the project, and as a result a first-class piece of social research has been set in motion by them. A recently closed United States Marine hospital has been turned over to the project, so that 60 beds are available, under university supervision, for the treatment of alcoholics, the average stay being up to three weeks. Thirty beds cater for these patients. Another 30 beds are set aside for those undergoing rehabilitation, and may be occupied by some only at night, once they have started to work again.

This demonstration unit is staffed by the following: a director, two certified internists (half-time), three psychiatrists (part time), a biochemist, an occupational therapist, a laboratory technician, five psychiatric social workers, one psychologist, three stenographers and a librarian. It is proposed to send physicians from this area to the summer school on the problems of alcoholism conducted at Yale University. The project is being financed through Federal Government grants-in-aid (available to any State), through New York State appropriations, and through the Community Chest of Buffalo City. An educational programme is being undertaken to supplement the therapy, and here again medical men are to the fore in the development of the plan. Lay organizations have repeatedly come up with the idea of a "lay-run" hospital for alcoholics. These have been tried and have always been failures. With university backing the Buffalo experiment may well be the answer to the problem of methods.

Other States are active also. Connecticut sets aside in a special fund 9% of the beverage tax annually, and this fund cannot be raided by any other agency. They have set up a model educational and rehabilitation centre around the Department of Applied Physiology at Yale University. The State fund is in the order of a quarter of a million dollars annually.

The medical literature in the United States of America has at least two first-rate journals on this subject: *The Quarterly Journal of Studies on Alcohol*, edited at the Laboratory of Applied Physiology, Yale University, New Haven, Connecticut, and an annotated bibliography with authors' abstracts, called *World Research in Alcoholism*, published by the State of Illinois, through the Illinois Neuropsychiatric Institute, 912 South Wood Street, Chicago, 12.

Correspondence.

A DEMOGRAPHIC YEAR BOOK.

SIR: The "Demographic Yearbook", 1948, published by the United Nations, fills so well a need felt by all interested in international comparisons of mortality and other vital statistical rates that I feel attention should be drawn to it. Its character and scope are best described by a quotation from page eight:

The United Nations Demographic Yearbook is intended to meet the need for a central source of demographic data and to replace, in due course, the noncomprehensive compilations which have, in the past, gone some way to meet this same need. The Yearbook, therefore, caters at once for the scholar in search of original data and for the general reader whose main interest lies in intertemporal and international comparisons of aggregates and rates. The Yearbook also meets certain needs of the United Nations and the specialized agencies, and of national governments and institutions. Because of the variety of needs which the Yearbook is intended to serve, its contents must necessarily be extensive. The detail given to particular subjects has, therefore, had to be limited. In many cases, too, limitations on the data included were already severely set by the deficiencies of national data.

Although certain of the tables included in the Yearbook are to be found in other publications, it was considered desirable that they should be reproduced here in order to make the Yearbook as comprehensive as possible. It is hoped, too, that the presentation of demographic data in a manner as standardized as

possible will encourage adoption of standard definitions and methods in this field.

The Statistical Commission and the Population Commission found it desirable, in view of the competing claims of different subjects for inclusion in the Year-book, to recommend the forty-eight general topics which are set out below.

The information in this first volume is set out as: (i) "Area and Population", (ii) "Economically Active Population", (iii) "International Migration", (iv) "Natality", (v) "Mortality", (vi) "Morbidity", and (vii) "Marriage and Divorce".

Every large medical or statistical library should possess a copy.

Yours, etc.,

H. O. LANCASTER.

School of Public Health and Tropical Medicine,
University Grounds,
Sydney.

February 8, 1950.

Obituary.

CHARLES WILLIAM ADEY.

DR. CHARLES WILLIAM ADEY, whose death was announced in a recent issue of this journal, was a graduate of the University of Melbourne. He qualified as Bachelor of Medicine and Bachelor of Surgery in 1920 and took the degree of Doctor of Medicine in 1922. He had served during the first World War in the Australian Imperial Force with the Third Light Horse Field Ambulance, attaining the rank of Staff Sergeant. He served in the second World War as Assistant Director of Medical Services of the Second Cavalry Division. From 1927 till the time of his death he was a member of the staff of the Commonwealth Serum Laboratories. He became a Member of the Royal Australasian College of Physicians in 1937 and he made several contributions to medical literature. At the Third Session of the Australasian Medical Congress in 1929 he read a paper on the determination of the antigenic value of anatoxin by laboratory methods. In 1938 he contributed to this journal a paper entitled "The Detection, Significance and Serological Treatment of Puerperal Sepsis due to *Clostridium Welchii* (Puerperal Gas Gangrene)". He was the President of the Commonwealth Medical Officers' Association.

Dr. J. Bell Ferguson writes: Some years before the last war I was at McDonald's Jetty, Swan Bay, near Queenscliff, and noticed on the beach a very small dinghy with an uncommonly tall mast. I then met the owner, Dr. Charles Adey, and after a while, discovered that Charles was intent on teaching himself the art of sailing in this dangerous contraption.

I spent a few days as our acquaintanceship ripened in trying to persuade him to (a) cut about eight feet off the mast and reduce the sail area, or (b) sell the thing. Charles adopted the second suggestion and thereafter sailed with me in a boat more suited to our respective ages and activity.

With a third friend, Mr. Bert Taylor, we used to cruise round Port Phillip Bay usually at Easter and Christmas. Charles loved this sort of life and seldom missed a cruise. If you want to know all about a man I would say that a cruise in a small yacht will invariably reveal defects—if any—and will also highlight the jewels of his character. I do not know the details of the academic period of Adey's life, but after visiting him at the Commonwealth Serum Laboratories, the scene of the greater part of his life's work, one immediately sensed that he was universally popular, liked and trusted by his brother officers and his staff. In addition to a fine scientific and critical mind, he also possessed in no small degree the gift of leadership, the capacity for sound administration. Others can speak more surely on these aspects of his work. As I have said above, life in a small boat reveals the true man as he really is.

I think the outstanding element in Charles's character was the essential kindness of the man. Over the years I never heard him pass an unkind remark about anyone. Also he was most conscientious—almost too conscientious, and would worry quite a lot over the problems of his own work and over the problems of his friends. His ready sympathy seemed, perhaps, to make him a bearer of other folks' burdens.

Charles was very much liked by young folk and always willing to join in anything. During the war he joined the Voluntary Naval Patrol and his ready wit, fund of anecdotes

and stories and a conscientious adherence to the job in all weathers in Port Phillip Bay endeared him to the other members of the Patrol. With old people, too, he won their interest, regard and trust in an almost uncanny way.

Few of his friends, perhaps, knew that Charles was a deeply religious man, again in a quiet and unostentatious way. His interests were wide and varied. He was a great reader and was enthusiastic over the theatre and the concert hall, and was something of an authority in the world of the films. He played tennis at one time and was a member of the Wallaby Walking Club, but these activities are known to me as it were by hearsay. The memory of Charles Adey will be cherished for many a day by all sorts and conditions of men who had the privilege of knowing him and of glimpsing his goodness and decency and kindness and gentle nature.

In truth he will live in all our memories as a truly gentle man.

Australian Medical Board Proceedings.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Manly, Gerald Arthur, M.B., B.S., 1947 (Univ. Melbourne), Ulverstone.

Swann, Jack Lindsay, M.B., B.S., 1945 (Univ. Melbourne), Devon Public Hospital, Latrobe.

QUEENSLAND.

THE undermentioned has been registered, pursuant to the provisions of *The Medical Acts*, 1939 to 1948, of Queensland, as a duly qualified medical practitioner:

Hansen, Thomas John, M.B., B.S., 1950 (Univ. Sydney), c.o. Hospitals Board, Maryborough.

Research.

NUFFIELD FOUNDATION DOMINION TRAVELLING FELLOWSHIPS.

THE chairman of the Nuffield Foundation Australian Advisory Committee (Sir John Medley) has announced the award of seven Nuffield Foundation Dominion Travelling Fellowships to Australians. The Fellowships will enable their holders to continue their researches for twelve months in England, and to meet and exchange ideas with English workers in the same fields. Fellowships in Medicine have been awarded to Dr. W. R. Adey, of Adelaide, Dr. J. W. Perry, of Melbourne, and Dr. Victor Wynn, of Melbourne. Fellowships in the Natural Sciences have been awarded to Dr. H. A. Buchdahl, of Tasmania, and Dr. L. H. P. Jones, of Melbourne.

Bibliography of Scientific and Industrial Reports.

THE following bibliographies, summaries of information and special reports have been prepared by the Commonwealth Scientific and Industrial Research Organization Information Service. Copies may be obtained on application to the Officer-in-Charge, C.S.I.R.O. Information Service, 314 Albert Street, East Melbourne, C.2. The bibliographies are, in the majority of cases, selective only. Applicants should state clearly the reason the bibliography *et cetera* is requested, because the number of copies available is limited.

- B.399: "Radioelements in Absorption and Nutritional Investigations", Tracer Elements Bibliography Number 8A. October, 1949 (207 references).
B.403: "Use of Radio-Isotopes in General Pathology and Cancer", Tracer Elements Bibliography Number 11A, November, 1949 (54 references).

- B.404: "Radioelements in the Study of the Digestive, Excretory and Glandular Systems", Tracer Elements Bibliography Number 12A, November, 1949 (54 references).
- B.405: "Radioelements in Hygiene, Toxicology and Pharmacy", Tracer Elements Bibliography Number 13A, November, 1949 (43 references).
- B.406: "Therapy with Artificial Radioelements", Tracer Elements Bibliography Number 15A, January, 1950 (44 references).
- B.407: "Study of Teeth and Saliva with Radioelements", Tracer Elements Bibliography Number 16A, January, 1950 (five references).
- B.408: "Radio-Isotopes in Embryology", Tracer Elements Bibliography Number 17A, January, 1950 (15 references).
- B.409: "Study of Muscle with Radioelements", Tracer Elements Bibliography, Number 18A, January, 1950 (six references).
- B.410: "Application of Radioelements to Brain, Nerve and Sense Organs", Tracer Elements Bibliography Number 19A, January, 1950 (11 references).
- B.411: "Stable Isotopes in Absorption and Nutritional Investigations", Tracer Elements Bibliography Number 20A, January, 1950 (58 references).

Nominations and Elections.

The undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Saunders, Richard John, provisional registration, 1949 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Elvy, Robert James, provisional registration, 1949 (Univ. Sydney), Sydney Hospital, Macquarie Street, Sydney.

Williams, Warwick Laurent, M.B., B.S., 1946 (Univ. Sydney), 3 Torrington Road, Strathfield.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Abrahams, John Joseph, provisional registration, 1949 (Univ. Sydney), Ryde District Soldiers' Memorial Hospital, Eastwood.

Adler, Leslie, provisional registration, 1949 (Univ. Sydney), 14 Balfour Road, Rose Bay.

Alchin, George Charles, provisional registration, 1949 (Univ. Sydney), 2 Knowlman Avenue, Pymble.

Alexander, Ruth Marie, provisional registration, 1949 (Univ. Sydney), Lithgow District Hospital, Lithgow.

Andrew, Margaret Lark, M.B., B.S., 1947 (Univ. Sydney), 78 Kuring-gal Avenue, Turramurra.

Bern, Max Heinz, provisional registration, 1949 (Univ. Sydney), 13 Elizabeth Bay Road, Elizabeth Bay.

Breinl, William, provisional registration, 1949 (Univ. Sydney), 49 Carabella Street, Kirribilli.

Brierley, June Cooper, provisional registration, 1949 (Univ. Sydney), Balmmain District Hospital, Balmmain.

Chaffey, Calder Harold, provisional registration, 1949 (Univ. Sydney), Ryde District Soldiers' Memorial Hospital, Eastwood.

Cohen, Stanley Victor, M.B., B.S., 1948 (Univ. Sydney), 25 O'Brien Street, Bondi.

Cramer, Earle William, M.B., B.S., 1948 (Univ. Sydney), 47 Shirley Road, Woilstonecraft.

Davies, Oswald Joseph, M.B., B.S., 1948 (Univ. Sydney), St. Joseph's Hospital, Auburn.

De Coek, Nanette Marie, provisional registration, 1949 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Donald, Gordon Frederick, M.B., B.S., 1948 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Finch, Richard Tennant, provisional registration, 1949 (Univ. Sydney), Western Suburbs Hospital, Croydon.

Fischer, Enid May, provisional registration, 1949 (Univ. Sydney), 8 Grosvenor Crescent, Cronulla.

Ford, Beryl Irene, provisional registration, 1949 (Univ. Sydney), Rachel Forster Hospital for Women and Children, Redfern.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED FEBRUARY 11, 1950.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory. ²	Australian Capital Territory.	Australia. ³
Ankylostomiasis	..	5(5)	1	..	..	..	..	..	6
Anthrax
Beriberi
Bilharziasis
Cerebro-spinal Meningitis	..	1(1)	..	1(1)	2(1)	..	..	..	4
Cholera
Coastal Fever(s)	1	..	..	..	..	..	1
Dengue
Diarrhoea (Infantile)	13(13)	..	..	..	..	..	13
Diphtheria	11(8)	6(5)	3(3)	..	4(4)	..	..	..	24
Dysentery (Amoebic)	..	10(10)	..	..	..	..	..	..	10
Dysentery (Bacillary)	4(4)	..	..	..	..	..	4
Encephalitis Lethargica
Erysipelae
Filariasis
Helminthiasis
Hydatid
Influenza
Lead Poisoning
Leprosy	2	..	..	..	2
Malaria(b)	..	1(1)	1	..	..	..	..	..	2
Measles	1(1)	..	..	..	..	1
Plague
Pollomyelitis	14(9)	5(2)	..	37(33)	..	..	..	..	56
Pottacosis
Puerperal Fever	1(1)	..	..	..	1	..	..	..	1
Rubella(c)
Scarlet Fever	10(6)	16(9)	9(2)	2(2)	6(3)	2(1)	..	..	45
Smallpox	1(1)	..	..	..	..	..	1
Tetanus
Trachoma
Tuberculosis(d)	24(15)	16(6)	23(19)	6(6)	8(5)	3(2)	..	..	80
Typhoid Fever(e)	1(1)	1(1)	..	..	1	..	..	..	3
Typhus (Endemic)(f)	1	..	..	..	..	..	..	..	1
Undulant Fever
Well's Disease(g)
Whooping Cough	5(2)	..	..	..	..	3
Yellow Fever

¹ The form of this table is taken from the *Official Year Book of the Commonwealth of Australia*, Number 37, 1946-1947. Figures in parentheses are those for the metropolitan area.

² Figures not available.

³ Figures incomplete owing to absence of returns from the Northern Territory.

⁴ Not notifiable.

(a) Includes Moxman and Sarina fevers. (b) Mainly relapses among servicemen infected overseas. (c) Notifiable disease in Queensland in females aged over fourteen years. (d) Includes all forms. (e) Includes enteric fever, paratyphoid fevers and other *Salmonella* infections. (f) Includes scrub, murine and tick typhus. (g) Includes leptospiroses, Well's and para-Well's disease.

Grahame, Barbara Ellen, provisional registration, 1949 (Univ. Sydney), Cessnock District Hospital, Cessnock.
 Hann, Lionel Frederick, provisional registration, 1949 (Univ. Sydney), St. George Hospital, Kogarah.
 Hopkins, Peter Frederick, M.B., B.S., 1948 (Univ. Sydney), c.o. Commercial Banking Company of Sydney, Limited, Gunndah.
 Lance, James Waldo, provisional registration, 1949 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
 Lisyak, John, provisional registration, 1949 (Univ. Sydney), Parramatta District Hospital, Parramatta.
 McGlynn, John Richard, M.B., B.S., 1948 (Univ. Sydney), 6 Daisy Street, Chatswood.
 McRae, Margaret Ruth, provisional registration, 1949 (Univ. Sydney), 31 Vaucluse Road, Vaucluse.

Corrigendum.

Dr. G. E. M. Scott has advised us that in his paper "Celiac Disease and the Celiac Syndrome", which appeared in the issue of January 14, 1950, the figures "8.2%", appearing in the second line, should read "17.1%". Dr. Scott states that he regrets the error.

Notice.

NINTH DIVISION MEDICAL SERVICES ASSOCIATION.

THE first annual dinner of the Ninth Division Medical Services Association will be held at "George's" Continental Restaurant, 259 Elizabeth Street, Sydney (a few doors from the R.S.L. Club), on Saturday, March 18, 1950, at 8 p.m. Those intending to be present are asked to advise the honorary secretary, F. G. True, "Mayfair", 232A Glebe Point Road, Glebe Point (telephone: MW 3091), not later than March 8, 1950. The cost will be fifteen shillings each.

Medical Appointments.

Dr. J. V. Vaughan has been appointed Quarantine Officer, Devonport, Tasmania, under the *Quarantine Act*, 1908-1947.
 Dr. A. N. Dickson has been appointed Deputy Quarantine Officer, Queenscliff, Victoria, under the *Quarantine Act*, 1908-1947.

Dr. Bernhard Monz has been appointed Visiting Medical Officer, Cherbourg Aboriginal Settlement, in pursuance of the provisions of *The Aboriginals Preservation and Protection Acts*, 1939 to 1946, of Queensland.

Dr. Ian Birchley has been appointed Senior Resident Medical Officer, Department of Medicine, Brisbane Hospital, Brisbane.

Dr. Roger Bennett and Dr. Laurel McIntosh have been appointed Senior Resident Medical Officers, Department of Anaesthesia, Brisbane Hospital, Brisbane.

Dr. Joy Parry has been appointed Senior Resident Medical Officer, Brisbane Children's Hospital, Brisbane.

Dr. M. C. Fowler has been appointed medical bacteriologist at the Institute of Medical and Veterinary Science, Adelaide.

Dr. J. A. Bonnin has been appointed clinical pathologist at the Institute of Medical and Veterinary Science, Adelaide.

Dr. A. H. Lendon has been appointed honorary surgeon at the Royal Adelaide Hospital, Adelaide.

Dr. J. R. Barbour and Dr. N. J. Bonnin have been appointed honorary assistant surgeons at the Royal Adelaide Hospital, Adelaide.

Dr. Eugene McLaughlin has been appointed honorary physician at the Royal Adelaide Hospital, Adelaide.

Dr. J. L. Hayward and Dr. J. M. Bonnin have been appointed honorary assistant physicians at the Royal Adelaide Hospital, Adelaide.

Dr. W. J. Freeman has been appointed an official visitor to the Lachlan Park Hospital, New Norfolk, Tasmania.

Dr. Robert Hecker and Dr. G. T. Ey have been appointed medical registrars at the Royal Adelaide Hospital, Adelaide.

Dr. D. N. Robinson has been appointed surgical registrar at the Royal Adelaide Hospital, Adelaide.

Dr. I. M. H. Camens has been appointed out-patients registrar at the Royal Adelaide Hospital, Adelaide.

Dr. Neil Hicks has been appointed pathological registrar at the Royal Adelaide Hospital, Adelaide.

Dr. A. R. Southwood, Dr. J. W. Rollison, Dr. William Christie, Dr. H. McIntyre Birch, Dr. L. R. Mallen and Dr. Helen B. Mayo have been appointed members of the Advisory Council on Health and Medical Services, pursuant to the provisions of the *Health and Medical Services Act*, 1949, of South Australia.

Diary for the Month.

MAR. 7.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

MAR. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.

MAR. 10.—Queensland Branch, B.M.A.: Council Meeting.

MAR. 13.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135 Macquarie Street, Sydney): Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester United Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

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